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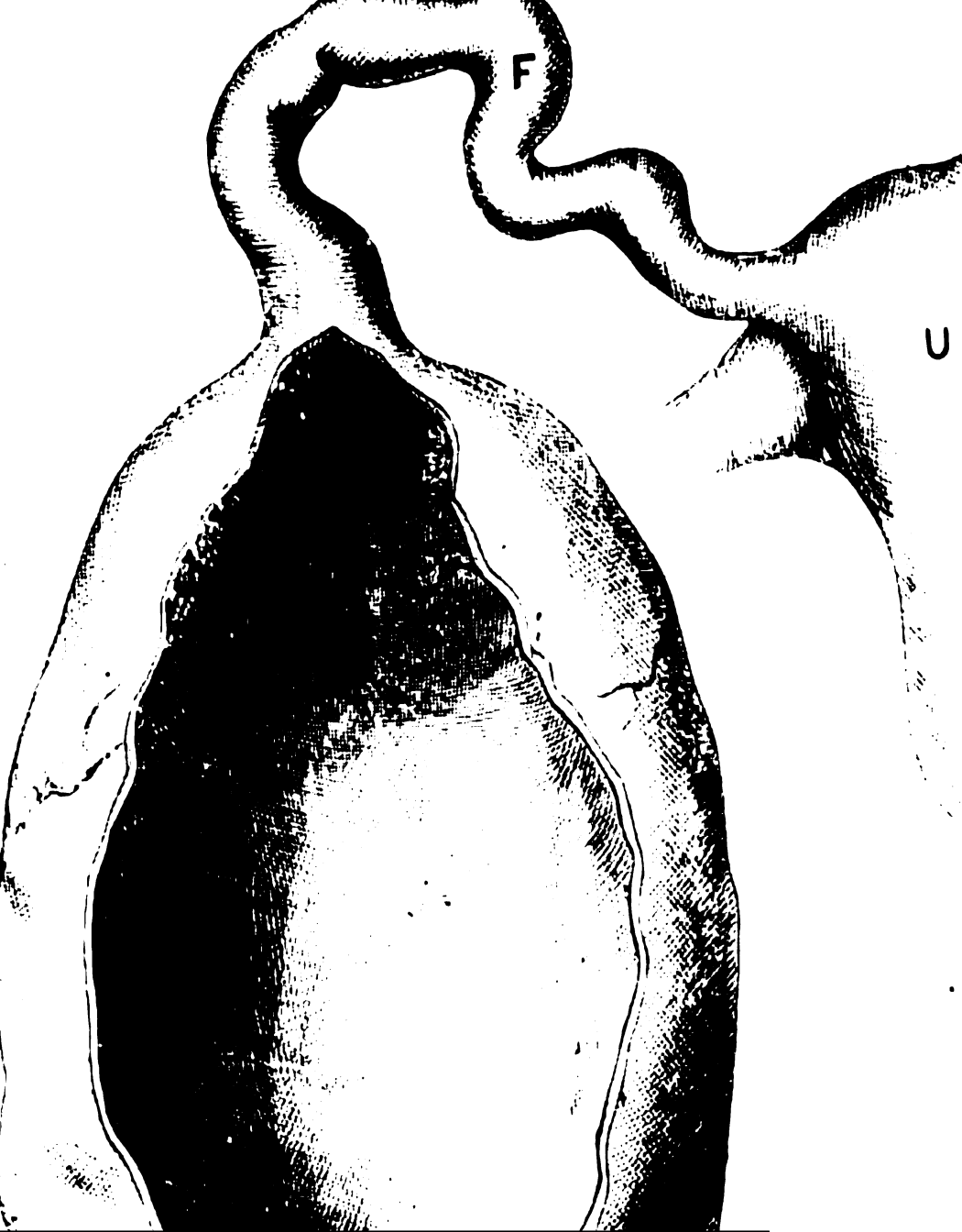
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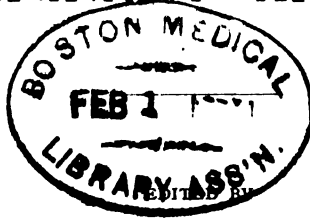


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THE JOURNAL
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W. A. CONKLIN, PH.D., D.V.S.,
DIRECTOR OF ZOOLOGICAL GARDENS, NEW YORK CITY.

RUSH SHIPPEN HUIDEKOPER, M.D., Veterinarian (Artfort),
*Professor of Sanitary Medicine and Veterinary Jurisprudence,
American Veterinary College.*
NEW YORK.

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Breisacher, Leo.
Bryden, Williamson.
Clement, W. A.
Curtice, Cooper,
Dinwidde, R. R.
Edwards, Fred. H. P.
Fleming, George,
Francis, M.
Griffen, E. Gerald.
Harger, S. J, J.
Hellier, J. B.
Hoskins, W. Horace.
Huidekoper, R. S.
Huilson, J. C.
Huntington, George S.
Jasme, A.
Johnson, D. A.
King, B. F.
Law, James.
Lee, Daniel D.
Lyfford, C. C.
Magnin, Louis.
Marsh, J. Wallace.

Mayo, M. S.
McLaughlin, John A.
Meyers, J. C.
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Vandever, George G.
Vulliamy, H.
Waugh, James A.
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Williams, W. L.
Winchester, J. F.

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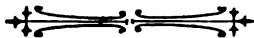
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THE JOURNAL
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JANUARY, 1891.

No. I.

COMPARATIVE PATHOLOGY.¹

BY J. BLAND SUTTON, F. R. C. S.

GENTLEMEN—With commendable judgment your Principal decided that it is desirable to institute a Chair of Comparative Pathology. This is a decision of no little importance, for it is the first time that this subject has been awarded so dignified a position in a college, veterinary or otherwise, in Great Britain.

You may well feel that the time at your disposal as students of the Veterinary Art is very limited, and this new impost may not be agreeable to some, but I will promise to make the subject interesting as far as lies in my power. For my own part, I look forward to our meetings with great pleasure, and feel sure that many of you will be able and willing to assist me in securing pathological specimens in order to demonstrate some of the principles which go to make up the Science of Pathology.

At the outset let me say candidly, that I shall tell you little which will be of use in the practice of the Veterinary Art, for Comparative Pathology bears much the same relation to it as the Science of Botany bears to Agriculture. Nevertheless, I can venture to predict that you will be none the worse for a knowledge of the facts and theories which belong to Comparative Pathology, and its study will often relieve the tedium of routine work and lead to broader conceptions of disease in general. Much of the mysticism formerly current in the profession of medicine (much

¹ Abstract of an Introductory Lecture to a Course of Comparative Pathology, delivered at the Royal Veterinary College, London, October, 1890.

yet persists) was due to ignorance of the fundamental principles of Pathology. Since Pathology has been more thoroughly studied medicine has become more and more of a rational art, although she is still fettered by traditionalism and the want of free thought among her followers.

Comparative Pathology is important to those who study the diseases of the horse as well as to those who study the diseases of mankind. The horse and man are exceedingly specialized mammals. Hippo-pathology is as special a study as Human-pathology, but Comparative Pathology is a department of Biology concerned in collecting facts connected with abnormal deviations in all living things; arranging the facts in groups in order to detect laws which underlie the origin of those aberrations of structure and function to which the term Disease is applied. It is therefore a wide subject of study, so wide, indeed so limitless, that to-day we shall merely consider a few examples which will serve to show the valuable aid Comparative Pathology lends to Special Pathology; how it throws light in unexpected directions and renders many obscure conditions intelligible without the amusing explanations of Teleology.

Few conditions illustrate more forcibly the advantage of studying Pathology in a comprehensive manner than the peculiar condition of the ovary and tube, often called *Tubo-ovarian cyst*, but which I shall prefer to speak of as

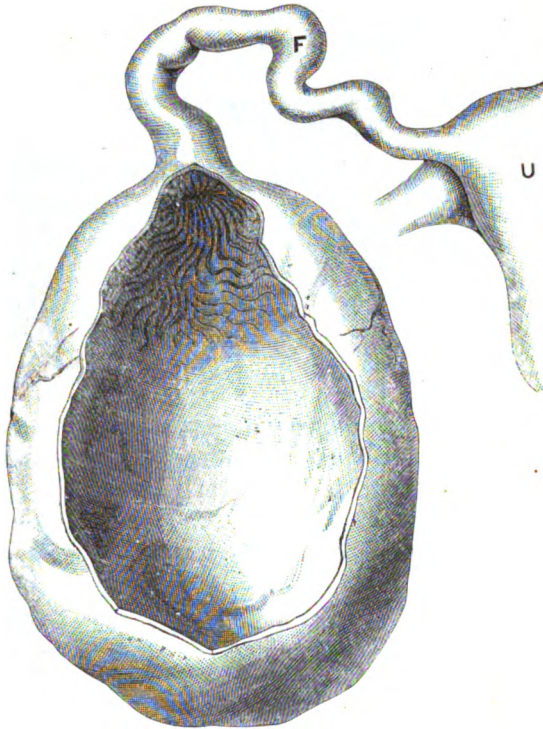
OVARIAN HYDROCELE.

True ovarian cysts (cysts arising in the egg-bearing portion of the ovary) do not burrow between the layers of the mesometrium (suspensory ligament of the uterus), consequently they do not involve the Fallopian tube. The tube may, however, adhere to the walls of the cyst in consequence of inflammation, and its abdominal ostium may become closed by adhesion of its fringes; but the tube never communicates with the interior of an ovarian cyst.

There is a rare form of cyst which I call ovarian hydrocele, in which the ampulla of the tube is dilated, tortuous and communicates by a large orifice with the interior of a cavity filled with fluid occupying the normal position of the ovary. The cyst and tube may be so intimately connected that it is impossible to determine where the tube ends, and the cyst begins. A tubo-ovarian hydrocele has been aptly compared to a retort with a convoluted delivery tube.

These hydroceles are not confined to the human female, for Schneidemühl¹ has described and figured a typical specimen which he obtained from a mare. He says the ovary was transformed into a pear-shaped bladder. It was 26 cm. long and 18 cm. wide, and contained fluid of a clear golden yellow color. The lumen of the tube was directly continuous with the cavity of the cyst.

FIG. 1.



An Ovarian Hydrocele (human).

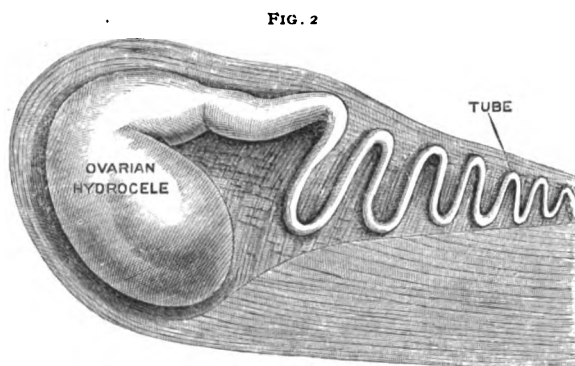
The ovary in many mammals lies in recess of mesometrium termed the ovarian pouch. In the majority of mammals the pouch is very shallow, in others it is deep, and in a few it forms an investment for the ovary as complete as the tunica vaginalis which invests the testes, but with this difference, the Fallopian tube communicates with the interior of the pouch.

The mode in which the ovarian pouch is formed has recently been investigated by McArthur Robinson.² The mammalian uterus, whether bicornuate or single, is attached to the abdominal walls by means of a peritoneal fold; the mesometrium, broad or suspensory ligament. In some mammals, with bicornuate uteri,

¹ Deutsche Zeitschrift für Thiermedecin. Bd. ix, S. 279, Beitrag zur Casuistik der Tubo ovarialcysten beim Pferde.

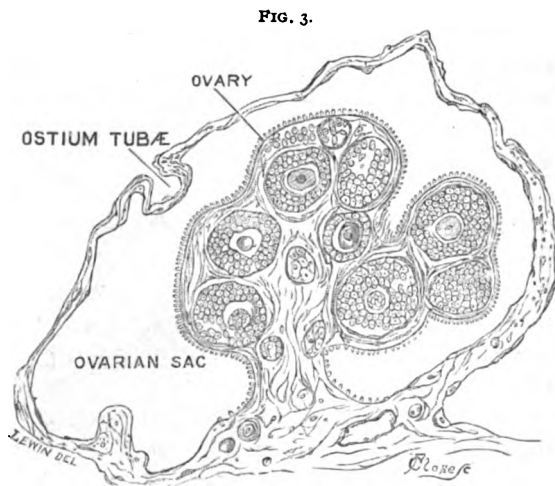
² Journal of Anatomy and Physiology, 1887. On the position and peritoneal relations of the mammalian ovary.

each ovary is immediately posterior to the kidney and is attached to the mesial layer of the corresponding mesometrium. In mam-



Ovarian Hydrocele in a Mare (after Schneidemühl).

mals in which the ovaries recede to the pelvis, the ovaries are still found attached to that layer of the mesometrium which was mesial, but now becomes dorsal. As a rule, the ovary is in shape a laterally compressed ovoid. One border is attached to the mesometrium, the other is free. Each extremity is connected with a ligament; one, the *ovarian ligament* is connected with the uterine cornu, the other is called the *diaphragmatic ligament*, and is either lost in the mesometrium (broad ligament) or, under certain conditions, extends to the kidney or diaphragm: These bands give rise to reduplications of the peritoneum and cause a shallow depression in that portion lying between the ovary and tube, conveniently termed the *mesosalpinx*. This depression may become so pronounced as to constitute a distinct sac.



Transverse Section of the Ovary and Ovarian Pouch of a Mouse (after Robinson).

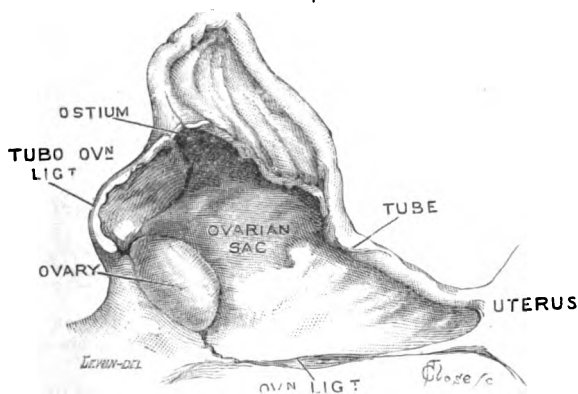
The Fallopian tube lies between the layers of the mesometrium, and in a few occupies the free edge of this structure; in many a fringe of this peritoneal fold extends beyond the tube. The abdominal ostium of the tube is funnel-shaped, but compressed so as to form an elongated slit; one extremity of the slit is attached to the ovary, the other is free. The orifice of the tube is parallel with the ovary and on the margin of the ovarian pouch.

As one end of the slit-like ostium is fixed, it necessarily follows that if the tube lengthen it must push forward between the layers of the mesosalpinx and become tortuous. Increase in the length of the tube is accompanied by growth of the mesosalpinx and serves to deepen the pouch which tends to invest the ovary. This condition is seen in the baboon (*cynocephalus porcarius*: Fig. 4). The pouch becomes more complete in the porcupine in consequence of adhesion of the free edge of the mesometrium at the uterine end of the tube to the fold formed by the ovarian ligament, reducing the orifice of the sac to a mere slit scarcely exceeding the length of the ovary. (Fig. 5.)

In a few mammals (badger, raccoon), the edge of the slit adheres to the attached border of the ovary, leaving merely a minute orifice near the uterine end of the ovary. In these mammals the pouch tightly invests the ovary. In the mouse and rat Robinson has shown that even this orifice is wanting, so that the ovary is shut off from the peritoneal cavity, and the abdominal ostium of the tube opens in the pouch.

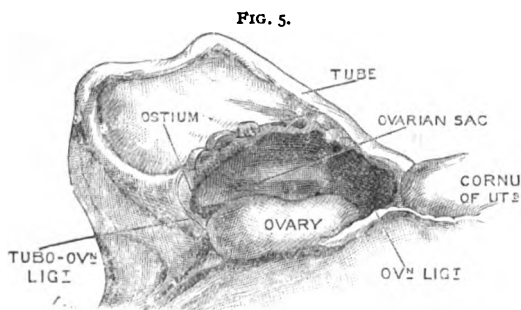
Ovarian pouches have long been known with the exception of the complete form described by Robinson, and we are entirely indebted to him for working out the method by which the pouch is formed. From

FIG. 4.



Ovarian Pouch of a Baboon. (After Robinson.)

what we know of the tendency of the peritoneal pouch of the testes to become the seat of accumulation of fluid (hydrocele), it



Ovarian Pouch of a Porcupine. (After Robinson.)

occurred to me to look for similar hydroceles of the ovarian pouch, for it was reasonable to believe that these pouches would occasionally be distended with fluid.

The Museum of University College contains such

a specimen, supposed to be an example of bilateral ovarian cysts in a guinea-pig.

The parts are sketched below. (Fig. 6.) The Fallopian tubes, much elongated and convoluted, pass round the outside of the almost globular translucent cysts. Their terminal segments are somewhat dilated, but the abdominal orifices are obstructed. The orifice of the tube is indicated by a circular depression on the wall of the cyst, and a few low ridges radiate from it.

On the wall of each pouch is the cystic remnant of the ovary, which bears precisely the same relation to the cyst that the testis bears to a hydrocele of the tunica vaginalis. This specimen from the guinea-pig is peculiarly interesting, because the ovarian pouch of this rodent resembles that of the porcupine,

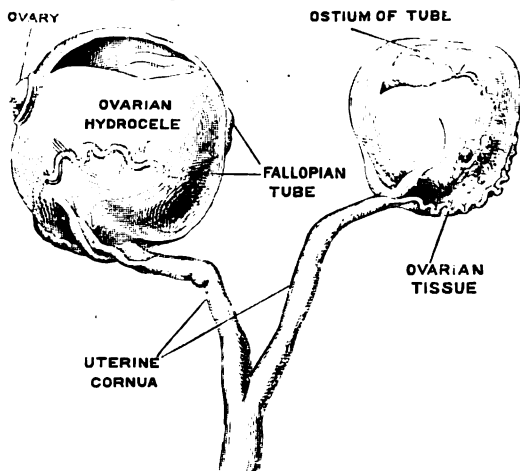
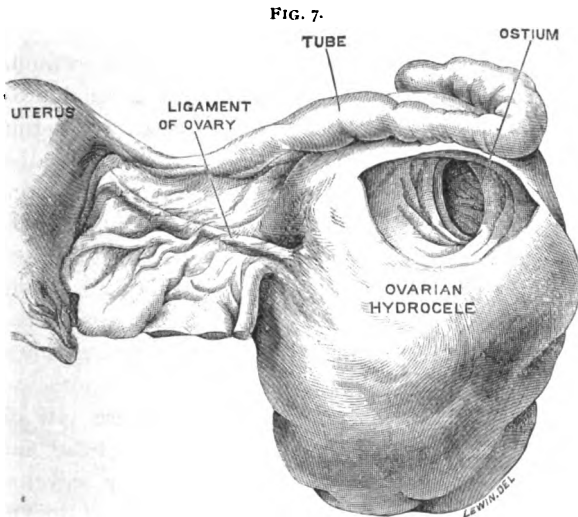


Fig. 6. Ovarian Hydroceles in a Guinea-Pig.

so that abnormal union of the edges of the slit (see Fig. 5) must have taken place to form a complete capsule.

With these facts in my mind, I re-examined an excellent specimen, described as a tubo-ovarian cyst by Dr. Griffith, which is preserved in the Museum of St. Bartholomew's Hospital. The parts consist of the uterus with the broad ligaments (mesometria), removed after death from a woman 27 years of age. The right side of the uterus, with the mesometrium, are sketched in Fig. 7. The right tube measures 23 cm. in length. The uterine segment is of normal size, but the outer third greatly distended and convoluted opens by a large circular orifice (5 cm. in diameter) into the cavity of a very thin-walled unilocular cyst measuring 13 cm. by 9 cm., which projects from the posterior surface of the right broad ligament. A few low ridges are seen at the spot where the tube and pouch become continuous. At the base of the cyst there is a stratum of ovarian tissue in relation with the ovarian



An Ovarian Hydrocele. (Museum of St. Bartholomew's Hospital.)

ligament. The cyst contained a thin, almost colorless fluid. My observations lead me to believe that this cyst is a distended ovarian pouch of the same nature as those in the guinea-pig, and the pressure of the fluid induced atrophy and flattening of the ovary.

Thus the anatomical evidence indicates clearly enough that these cysts are similar to hydroceles occurring in relation with the tunica vaginalis testis and, in course of time, exercise the same influence upon the ovary as upon the testis and induce atrophy from pressure.

A PECULIAR MONSTROSITY.

BY DANIEL D. LEE, M.D.V.,

Instructor in Anatomy, Veterinary Department, Harvard University.

I WAS called to see a valuable Jersey cow that had just calved, and found all the men on the place, in the absence of the owner, very much excited.

The calf was what is known as a celosomian monster, that is, one having a ruptured body.

I found on weighing the creature that it reached 47 lbs.; it was well developed and proportioned, and had its first teeth through the gums.

The spinal column was bent downward in the centre and upward at each extremity, thus forming a deep depression on the upper surface of the body.



EXPLANATION OF FIGURE.

The calf is lying on the left side with the fore parts rotated to the right. The neck is concealed, and the head shows behind the hind legs. From the opening in the chest and belly hang the lungs and heart, *A* and *B*, and the rumen, reticulum and omasum marked *C*; the intestines showing further back, *D*.

The thorax and abdomen had never closed, and in place of the parietes there was a large diamond-shaped opening.

To the skin at the edge of this opening were attached the foetal envelopes, and from it protruded all the thoracic and abdominal viscera, all of which, as well as the head and limbs, were perfectly developed, although bent and twisted in all manner of positions, as may be seen by the photograph. The sex was female.

Fleming says that such cases are quite frequent, especially in cows, and cites a number; in none of them do the creatures seem to be as complete in all their parts as in this case.

The cow required no assistance, and never licked the creature or paid any attention to it; she was supposed by the men on the place to have attacked the calf and maimed it, and they, supposing her to be mad, had sent for me.

ROARING.

*(Hemiplegia Laryngis.)*¹

BY LEO BREISACHER, V.M.D.

WITHIN the last year much has been written about the operation known as laryngotomy. The chaotic results obtained by various surgeons are bewildering, and to persons not acquainted with the facts of this *matter* the various claims as to the originator of this operation are misleading. Among veterinarians, as among professional men of different calling, one meets with a certain degree of strife and rivalry. Against honorable and *pure* rivalry no objection can be raised. When, however, overzealous individuals in their desire to emulate, use means which give them publicity and notoriety, to which they righteously have no claim, an interception becomes necessary. Leaving aside the plagiarism which has been practiced in connection with laryngotomy, I ask you, what have we gleaned from the various writings on the subject? and can but answer, nothing conducive of a proper and lucid conception of it. If laryngotomy is to be universally practiced, the profession should be presented with the RECORDS and results of the different operations, so that it can thoroughly and rationally test the efficiency of operative interferences as a means of relieving roaring. To-day, laryngotomy bids fair to fall into disrepute as it did twenty-six years ago, and only because its *modus operandi* has not been properly promulgated. The fact that eminent veterinarians fail with this operation leads us to suspect that the success of "lesser lights," in many cases, is rather due to a combination of accidental circumstances than to an actual comprehension of the subject. To accurately and efficiently perform laryngotomy considerable dexterity is necessary, which should be cultivated on the cadaver. Ere describing the operation proper, we would like to summarize in a short manner a few interesting facts which are linked to laryngotomy.

Galen and Riolan (1612) performed section of the recurrent

¹ This is the term given by H. Moeller in his work, *Das Kehlkopfspfeifen der Pferde und seine operative Behandlung*. Stuttgart, 1888. Fleming terms it *Laryngismus Paralyticus*.

laryngeal nerve on swine, so that their cries would not be heard while being "stuck." Lenglois, in 1812, through his experiments, first directed attention to the recurrent laryngeal nerve as a factor in the production of roaring. Godine (1811) is given the credit of having first intimated that roaring was due to an immobile arytenoid cartilage. Youatt (1833) was the first to describe the unilateral atrophy of the laryngeal muscles in roaring. Not only is the date of the first operation of laryngotomy but also its instigator often confounded or erroneously given. F. Guenther in 1823 experimentally produced roaring in horses. He busied himself with this subject until 1830. K. Guenther, a son of the above-named, was the originator of laryngotomy, performing the first operation in 1863. In 1885 Prof. Moeller rekindled an interest for laryngeal surgery by instituting a series of experiments relative to laryngotomy. He first tested the methods of Guenther, which he abandoned, although they proved beneficial in many instances; but again adopted them, with modifications, after having tested some newly-devised procedures. As will be seen later on, Moeller's labor has been crowned by the most brilliant results. To dwell upon the anatomy and physiology of the larynx would be superfluous, our object being only to rehearse this subject from a surgical standpoint. Of the various factors and conditions—such as enlarged lymphatic glands, polyps, calcification and contraction of the larynx, which occasion in some instances symptoms similar to those of laryngeal palsy—the reader is acquainted with. Here, where we are only dealing with hemiplegia laryngis—or laryngismus paralyticus, as you may choose to call it—only the principal measures for the recognition of this trouble will be dealt with. By applying the various tests it is almost impossible to err in a diagnosis. To locate the roaring in the larynx is far less difficult than to define the seat of the trouble when the larynx has been found to be free from abnormalities. Turning the head of the animal to the side opposite to that on which the atrophy of the laryngeal muscles exists, increases the respiratory sound. The noise (roaring) is generally an inspiratory one, but at times also expiratory. (In tracheal and laryngeal tumors the expiratory sound is louder than the inspiratory one.) Pressure on the palsied side of the larynx increases the roaring. By this method Moeller diagnosed, by exclusion, fibrous thickening of the larynx. The experi-

ments of Guenther seem to prove that extension of the guttural pouches cannot occasion abnormal respiratory sounds likely to be confounded with roaring. Thickening of the nasal mucous membrane causes a sniffing sound. The trouble is usually unilateral, and can be diagnosed by closing one nostril and then the other. But we have already wandered from our laryngeal trouble, which we promised not to do.

As to the primary causes of roaring many variegated tenets exist, which we will only review hurriedly. We have, for instance, pulsation of the aorta; displacement of the heart, which is by some authorities claimed to take place during growth of the animal. Both of the preceding conditions, we need hardly mention, are supposed to act upon the inferior laryngeal nerve. Again, stretching of the nerve-trunk during growth of the cervical structures is by some looked upon as a factor in the production of roaring. Some hold that the above supposition explains why roaring is oftener met with in the male, where, as is known, the cervical structures assume a greater length, than in female horse. Training, by increasing the bloodvessel calibre, is held to be the cause of roaring in race animals—the increased bloodvessel calibre causing tension of the fascia-endothoracica, a strand of fascia extending from the pericardium to the trachea and covering the inferior laryngeal nerve. As is seen, many conditions can interfere with or wholly extinguish the functions of the inferior laryngeal nerve, which is the motor nerve of the entire laryngeal muscles with the exception of the crico-thyroid muscle. Moeller mentions that the greatest number of cases of roaring occur or develop between the age of three and six years, which points to the possibility that an uncomplemental growth between the nerve-trunk and the remaining cervical structures is in some cases the cause of the trouble. But here speculation has such a vast space to parade in that many theories can with little difficulty be adjusted, one apparently as valid as the other. That roaring can be transmitted from generation to generation has long been recognized. However, to what extent one is justified in withholding a roarer from the breeding-harem is not as yet quite clear. Where roaring can positively be traced to a thoracic trouble, or some other accidental cause, we are of the opinion that no great fears need be entertained. Nevertheless, hopes of evolving a valuable strain of animals from a roarer should never be cherished. On

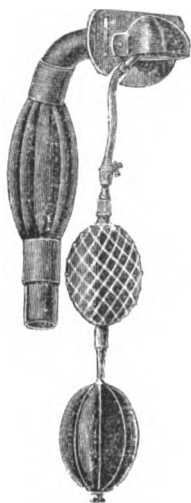
the other hand, when roaring arises during or after a course of training or during growth of the animal, or where no accidental causes can be traced, the animal should be pronounced unfit for breeding purposes. Norfolk and Suffolk breeders were at one time assured that roaring was not hereditary, which had deplorable effects upon the breeding interests of those districts. It is evident that with our new method of relieving roarers, great care should be exercised in examining animals destined for the breeding ranks. Roaring develops equally slow, whether arising in young animals or as the result of pneumonia and kindred affections, so that no light can be shed on the matter from this source. Two cases have been recorded in which roaring developed itself with fabulous rapidity, both during violent exercise, one a saddle the other a draft animal. As already mentioned, K. Guenther, in 1863, was the first to attempt a surgical operation for the relief of roaring. He first attempted partial excision of both vocal cords. Deriving no benefit from this procedure he extirpated the entire vocal cord of the affected side of the larynx. Excision of the vocal cords and ventricle was next tried, however, with poor results. Extirpation of the entire arytenoid cartilage was then attempted, but here the animals died of mechanical pneumonia (Schluck-pneumonie) caused by the entrance of saliva and food-particles in respiratory organs. Partial arytenoid extirpation was also tested; in some cases it gave relief, while in others the respiratory abnormalities were increased. Guenther's last attempt was to detach the vocal ventricle on the diseased side of the larynx and separate the arytenoid cartilage from its thyroïdal attachment. This mode of operation also gave variable results, once beneficial then again the reverse. Guenther ascribed poor healing processes as the cause of failure in the majority of cases operated according to the last method. Now, Gerlach appeared in the field; he, however, condemned operative measures as a means of relieving roaring after having performed a few operations. Stockfleth also tested Guenther's operations; condemning them, however, after giving them a short trial.

Several other prominent veterinarians experimented with this operation, but each succeeding trial only tended to obscure laryngotomy more and more, until finally it was mentioned only as a historical fact. Until Moeller, in 1885, instituted his experiments, laryngotomy had received absolutely no further attention.

He first tried section of the vocal cords with results similar to those of Guenther. He now devised the following four methods, one giving way to the other, the fourth proving to be the proper one. As will be noticed, method four really belongs to Guenther, but in Moeller's hands, modified and supported by various therapeutical measures, it first gained recognition and prestige.

Method number one consisted in opening the aryteno-thyroid articulation, entrance to the interior of the larynx being effected by an incision of the cricoid cartilage and the first two tracheal rings. Method number two consisted in cutting the posterior crico-arytenoid muscles on the palsied side of the larynx—the idea was that the ensuing connective tissue-growth would contract, and thereby bring the cartilages into their normal position. In method number three the arytenoid cartilage was ligated to the thyroid cartilage by means of sutures. The operation was performed without opening the larynx or trachea. As aforementioned, the first three procedures proved ineffectual. Method number four, which will now be described, is the only one which, in the hands of Moeller, has given satisfactory results. It consists in totally extirpating the arytenoid cartilage. Guenther, who had tested this method, found that the entrance of blood into the respiratory tract during the operation was a great obstacle. This barrier was overcome by Moeller by using the tampon canula (Fig. A). This instrument consists of a long tracheotomy tube, the outer shaft of which is surrounded by a dilatable rubber bulb. The rubber bulb, attached to the tube, is introduced into the trachea and inflated by means of a small air-pump apparatus, which is connected with the bulb by means of a piece of rubber tubing. The bulb should be inflated, the rubber tube tied, to prevent the egress of air, and separated from the air-pump. Through this means, blood-clots, etc., are prevented from entering the lungs. To perform the operation, the animal is to be cast and then brought thoroughly under the action of chloroform, Tampon Canula. (Moeller.)

FIG. A.

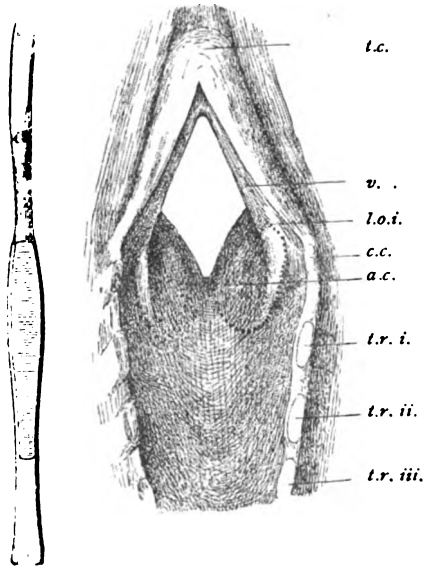


which is most safely and efficiently done by placing a *thin piece of flannel over either one of the nasal openings* and allowing the chloroform to fall in separate and distinct drops, from a drop-bottle, at intervals of one or two seconds upon the flannel. The narcosis being complete, the animal is laid upon its back and kept in position by means of straw proppings. The hair having been shaved and the skin thoroughly cleansed in the region of the larynx, the animal is in readiness for the operation.

Firstly, the skin should be incised, then the sterno-hyoid and sterno-thyroid muscles carefully separated, the third, second and first tracheal rings and the cricoid cartilage incised, the tampon canula rapidly inserted and the rubber bulb inflated. Care should be taken not to inflate the rubber bulb more than necessary, lest necrosis of the mucous membrane would result. The canula is held in place during the operation by attaching a piece of tape to it, which is held, by an assistant, in a line parallel with the neck. By means of two strong hooks the incised structures are now forced widely apart and the operation can proceed. The arytenoid

FIG. B.

FIG. C.



Larynx of horse after separation of the cricoid cartilage and the first three tracheal rings. *t.c.* thyroid cartilage, *v.c.* vocal cord, *l.o.i.* line of incision, *c.c.* cricoid cartilage, *a.c.* arytenoid cartilage, *t.r.* first, second and third tracheal rings. (Moeller.)

cartilages should be noticed whether or not they act harmoniously. During even ordinary respiratory movements the palsieside is easily recognized. However, to further confirm the diagnosis, the larynx should be irritated with some blunt instrument, whereupon a deglutition movement ensues which brings to light any motor deficiency of the laryngeal apparatus which may exist. The extirpation of the arytenoid cartilage is performed with a slightly convexed blunt-pointed bistoury (Fig. B). The blunt end of the bistoury serves also as a probe in separating the cartilage from its muscular

attachments. The arytenoid cartilage is extirpated by incision

commencing at the transverse arytenoid cartilage, and carried as is indicated by the dotted lines in Fig. C. By means of the blunt-pointed bistoury the muscoli crico-arytenoidei are detached from the arytenoid cartilage. With a curved scissors the vocal cord is separated from the arytenoid, while the latter is freed from the mucous membrane of the thyro-epiglottidean fold. To effect this, Moeller recommends that the finger of the left hand be introduced into the cul-de-sac of the fold, and by gentle pressure liberating the cartilage from it.

The cartilage should be separated from the thyro-arytenoid muscle, freed from any adherent connective tissue, grasped with a tenaculum and severed completely from the laryngeal wall. Care should be taken that the remaining portion of the arytenoid cartilage does not protrude, lest it form a nucleus for extensive granulations and connective tissue growth.

Prof. Moeller informs me that he has found that suturing of the lacerated mucous membrane greatly facilitates the healing of the parts. After the operation the wound should be thoroughly cleansed with water, and then treated with a 10 per cent. chloride of zinc solution. Following the above procedure, a mass of oakum or jute, consisting of a number of small and delicately rolled balls, sprinkled with tannin and iodoform, should be introduced into the laryngeal cavity. To insure safety and facilitate the removal of the oakum ball, a thin cord should be passed through and around it, and the ends tied around the animal's neck. The skin should be sutured in three places. The tampon canula is held in position by means of two strands of cord or tape, which should be quite firmly tied, displacement being prevented by interlacing them with the mane. The animal should be placed, unhaltered, in a box-stall without bedding, and food is to be withheld for twenty-four hours. After elapse of the *fast* the sutures are to be removed, the oakum extracted, and the wound cavity thoroughly cleansed.

The canula should be removed and replaced by a clean one. After having dilated the rubber bulb of the canula as before described, the animal should be allowed to drink some water from a pail placed upon the floor. The animal's thirst having been quenched, the wound should be irrigated with a 1-1000 sublimate solution, and finally dusted with equal parts of tannin and iodoform. Hay should constitute the only food for three or four days

following the operation. After this period the canula can be withheld and soft food, as ground oats and bran, can be fed.

Under daily repeated cleansing the wound should be allowed to heal, which is generally accomplished in from three to four weeks. In eight weeks, or even less, after the operation, the animal can be exercised, beginning with walking exercise and gradually increasing the rate and quantity of work until the animal has developed its full working capacities again. In some cases a slight abnormal sound exists, which, however, generally disappears within five to six months. Some of Prof. Moeller's animals were again at work four weeks after the operation. Of 30 of the first animals operated upon, according to the Moeller method, 22 were entirely *cured*. Five of the remaining eight horses were only partially benefited; two died of septicæmia, while the remaining animal met with an accident, which necessitated its destruction. Since the above 30 operations, 70 additional ones have been performed with but two unfortunate terminations; one animal remaining a roarer, while the other was affected with abnormalities of deglutition.¹

THE SCREW-WORM.

BY M. FRANCIS, D.V.M.

SEVERAL years ago I published some notes on the screw-worm,² giving only such facts as I had witnessed, and remedies which I had employed. After two years of study and observation, during the summer months of which I have seen cases of the parasite almost daily, it is thought advisable to give a more exhaustive report of the life history of the insect, together with illustrations (see note 1) and description (see note 2) for identification.

The screw-worm is the larva or maggot of a dipterous insect (*Lucilia macellaria*) that is very common in this portion of the country during the summer, and is parasitic on man and animals.

The mature insect ("Imago") is a fly, a trifle larger than our

¹ In the above we have resorted to Moeller's work on "Kehlkopfpeifen" for the history and the description of the operation.

² First Annual Report of the Texas Agricultural Experiment Station.

ordinary house fly, with a yellow head and three dark longitudinal lines on the thorax. The abdomen is yellowish-green. The fly lays its eggs in wound sores, and even in the natural openings of man and animals.

In "Animal Parasites and Messmates," by Von Benenden, page 119, there appears the following: "There is another fly in Mexico which is dangerous to man; it is known by the name of *Musca hominivora*, or more correctly, *Lucilia hominivora*. Vercammer, a military surgeon of the Belgian army, relates that a soldier in Mexico had his glottis destroyed, and the sides of the roof of his mouth rendered ragged and torn, as if a cutting-punch had been driven into those organs. This soldier threw up with his spittle more than two hundred larvæ of this fly."

Prof. James Law, of Cornell University, in a letter to the writer, says: "Under the name of *Lucilia hominivora* it is said to be very destructive to the French convicts at Cayenne, the fly depositing its eggs in the mouth and nostrils during sleep."

No cases in man have fallen under the personal observation of the writer.

The fly seems to be well distributed over the American Continent, for Dr. Williston, of Yale College, writes that "it occurs everywhere from Canada to Patagonia." Although so generally distributed, only in Texas does it bear an economic importance in the United States. Of all our domesticated animals cattle suffer the most from its ravages. They occur in wounds from horns, castrating, spaying, branding, dehorning, barbed wire injuries, and often where ticks have burst on the brisket, flank, or just behind the udder of cows. They often occur in the vulvæ of fresh cows, especially if there has been a retention of the placenta or afterbirth. Young calves are almost invariably affected in the navel and often in the mouth, causing the teeth to fall out. One case occurred in the first stomach (paunch, or rumen) that is worthy of mention: Last September the writer had occasion to kill a Jersey bull calf, probably two months old, that had screw-worms in both hind legs just above the hock joint. On opening the abdomen I found hair-balls in the stomach (rumen), and, to my surprise, about twenty-five fully matured screw-worms almost buried in the wall of that organ. I placed some of the worms in moist earth, and in ten or twelve days they hatched out genuine screw-worm flies. How did they come there? My opinion is that

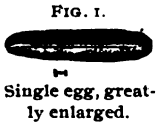
the calf licked the sores on his legs, and in doing so took in some eggs that hatched and developed in the stomach.

Horses and mules are not so often attacked. In them they are usually found in barbed wire injuries, and occasionally in the sheaths of horses, the vaginae of mares, and the navels of colts.

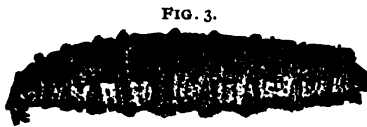
Hogs are more liable to become affected than horses. They are frequently wounded by dogs and by fighting, or there may be barbed wire injuries, wounds from castration, etc.

Sheep are comparatively free from attacks unless injured by dogs.

In all animals alike, the eggs, after being laid by the fly, hatch into larvæ or so-called "worms."



The exact length of time this requires seems to vary with circumstances. My present opinion is that, if the eggs are laid in a moist place and on a warm day, it requires less than one hour; whereas, if laid in a dry place they seem to dry up and lose their vitality.



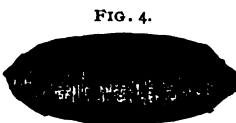
Larva ("Screw-worm").

The young larvæ when first hatched are small and easily overlooked. If they are hatched on the surface in a drop of blood from a



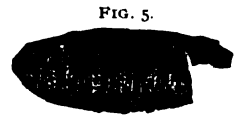
Bunch of Eggs.

ruptured tick, for instance, they attempt to perforate the skin, and if hatched in wounds they at once become buried out of sight. They seem to attach themselves by their heads, and burrow their way under the skin, completely devouring the soft flesh. Occa-



Pupa, or Chrysalis.

sionally a few are seen moving from one place to another, but usually they remain fixed at one point. The worms grow steadily in size, and the hole in the flesh becomes larger every day. Sometimes the worms make tunnels, but not to any depth; they usually stay on the surface. They evidently produce considerable irritation, for the part is always swollen and constantly bleeding. This swollen, gaping appearance of the



Pupa case, showing broken end where fly emerged.

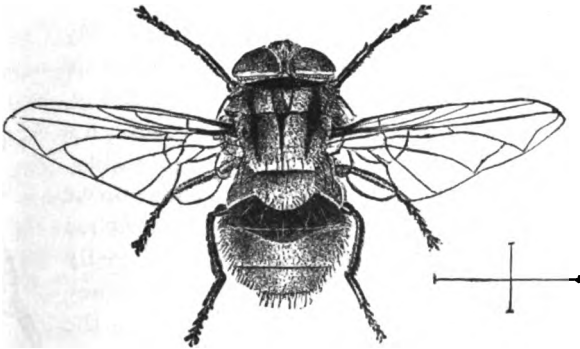
wounds, together with the constant discharge of blood, are characteristic of the presence of worms. It seems to require about a week for the worms to become fully grown. At that time they are about five-eighths to six-eighths of an inch long. They then leave the sore and go into the ground, where they pass their pupa state and hatch out as flies in from nine to twelve days. Of several hundred hatched out by the writer, the shortest time was nine days and the longest fourteen days, but in the majority of cases it required from nine to twelve days.

FIG. 6.



Side view of head and mouth parts.

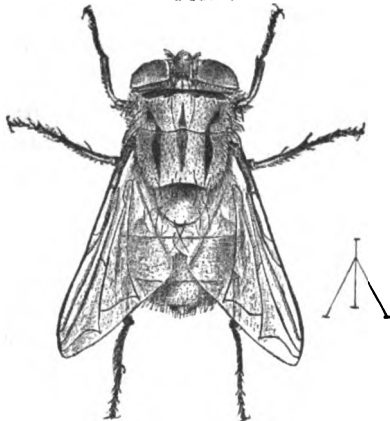
FIG. 7.



Screw-worm Fly, wings expanded.

While the larvæ are thus developing the flies are constantly laying fresh eggs in the wounds, so that the young worms take the places of the matured ones, and thus keep up a constant and progressive loss of tissue. If the worms are not killed they eat constantly deeper, and often kill the animal. Sometimes the abdomen is opened and the bowels escape—as is especially liable in case of heifers spayed through the abdomen. At other times a tail is eaten off, or extensive caverns are made into the muscles.

FIG. 8.



Screw-worm Fly, wings at rest.

The treatment usually employed in these cases consists simply of killing the larvæ with cresylic ointment, calomel, chloroform, or carbolic acid. The selection of the most suitable remedy will vary somewhat with the location, character and extent of the sores. In some cases bandages are useful. In others the sores can be filled with oakum and a few stitches taken. All treatment should be supplemented by daubing the margins of the wound with pine tar to ward off the fly. A vast number of cases can be prevented by keeping cattle free from common cattle ticks.

NOTES.

NOTE 1.—The illustrations used in this Bulletin have been prepared from the living insect in its different stages by Miss Freda Detmers, of the Ohio Experiment Station, at Columbus, Ohio.

NOTE 2.—Description by Clarence M. Weed, Entomologist to the Ohio Experiment Station, at Columbus, Ohio.

COMPSOMYIA (LUCILIA) MACELLARIA.

IMAGO.—Length 10 mm. ($\frac{3}{4}$ inch); wing expanse 21 mm. ($\frac{3}{4}$ inch); color metallic bluish-green with golden reflections; thorax with three black longitudinal stripes; head, except central portion of eyes, yellow; legs black; wing veins black; wings transparent except near base, where they are slightly clouded. Entire body furnished with long black spinose hairs. Proboscis of medium length, with dilated tip.

LARVA.—Length 16 mm. ($\frac{3}{4}$ inch); diameter 4 mm. ($\frac{1}{4}$ inch). A whitish footless grub of shape represented in figure 3, with rows of stiff black bristles at each articulation.

PUPARIUM.—Length 10 mm. ($\frac{3}{4}$ inch); diameter 3 mm. ($\frac{1}{4}$ inch). Brown in color and of shape represented in figure 4.

EGG.—Length 1 mm. ($\frac{1}{25}$ inch). Cylindrical, with a longitudinal ridge on upper side. Whitish.

OPEN LETTER—ANSWER TO DR. PAQUIN.

EDITOR JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES:—

DEAR SIR:—The open letter contributed by Dr. Paquin to the December number of the JOURNAL is remarkable in several respects, but calls for attention chiefly because of the misrepresentations which it contains. It is somewhat remarkable, considering the interest manifested, that the Doctor hesitated to enter into a

full discussion at the Chicago meeting of the U. S. Veterinary Medical Association, especially as his investigations were criticised in the report of one of the committees, and every one conceded him the right of making the fullest possible reply. It was generally supposed that he defended his position as well as the merits of the case would permit, and the reader of his letter will search in vain for any fresh arguments in his favor. Instead of bringing additional evidence to support his investigations, his object now appears to be rather to assume the rôle of injured innocence, by posing as a modest investigator who has been unjustly criticised and wronged without excuse.

Now what are the facts? In the brief remarks on Texas fever, contained in the paper which I read at Chicago, Dr. Paquin's name was not mentioned, nor were his investigations discussed. With the report made by the Chairman of the Committee on Diseases I had nothing to do, neither having been consulted in its preparation nor having any idea of its contents until it was read. Whether that report was too harsh in its references to Dr. Paquin can be decided by each individual reader for himself. Dr. Paquin was there to present his own side of his case and was listened to respectfully. And when the investigations of the Bureau of Animal Industry were commented on by both of the principals in the discussion, I claimed the same right to defend my work that was freely granted to him. It was a free and open discussion, where we all endeavored to give the reasons for our views, and Dr. Paquin has no more reason to "protest against the positiveness and exclusiveness" with which Dr. Clement and myself explained our views, than we have to enter the same protest against his remarks. In either case a protest is ridiculous, for the most important business of a scientific meeting is to bring out discussions and enable investigators to present their evidence and views with all the clearness and positiveness at their command, due allowance being made for that fairness and courtesy which should always characterize scientific gatherings.

Dr. Paquin also protests against "the uncalled-for allusion to jealousy which was hurled from such a high official position as Dr. Salmon's." This is making a very large mountain out of a small mole-hill. The report of the discussion as taken by the stenographer and printed in the *JOURNAL* for November bears me out in the assertion that no "allusion to jealousy" was hurled

at our super-sensitive friend. The only time I used the word was in the following paragraph, called out by the somewhat personal character of the discussion which had taken place between Drs. Paquin and Clement, and the references made to my own work. I trust your readers will examine the language carefully and see for themselves just how much cause the gentleman has for printing an open letter of protest. The remarks were as follows :

"I regard it as unfortunate that there should be so much feeling between different investigators in the same field of work. There is room enough for all of us to work and surely enough to be done, and the important questions connected with these diseases will be solved none too soon if we all work and strive together to throw what light we can upon the subject. As far as I am concerned, I feel no jealousy in regard to the work of Dr. Paquin, or any other investigator, and I should feel great regret if I knew there was any such jealousy in regard to my work, because I appreciate the importance of all working together. We will naturally get some different results, but when we come to put these together and study them, and draw our conclusions, we will probably see that each from his standpoint, from his methods of work, is able to throw light upon the problems which we all desire so much to understand."

After these remarks were concluded Dr. Paquin arose and expressed his pleasure at the spirit of the discussion, saying it was exactly what he wanted !

The Doctor goes on to say, in his letter, "Dr. Salmon tells us that *tics* carry Texas fever to the North. We had explained that in our bulletin, but Dr. Clement and he ignored it, as they did every other new point of practical value found in our bulletin." If Dr. Paquin had reflected a moment he would have remembered that I made no attempt to review his bulletin. My remarks were called out by the discussion and were confined to the assertions therein made. If he wished his investigations in regard to *tics* discussed he had every opportunity to bring up the subject, but having failed to do so, he has no right to blame others for his delinquencies.

Now that he insists that he has explained the action of ticks in his bulletin, we will briefly review his utterances on that point and show how much (or how little) his investigations in that direction amounted to. In the conclusions on page 55 (Texas Fever

Bulletin) he says: "Ticks and the feet of cattle are capable of carrying the germs to distant lands." What does this mean? Does he intend to give the impression that ticks when not carried by cattle may migrate to distant lands and infect them? Or that they only infect lands when carried by Southern cattle? In either case, how does he know that ticks are capable of carrying the germs to distant lands? Does he give an account of any observations or experiments which demonstrate this assertion? Not at all.

By retracing our way through his bulletin we find on page 52 this statement: "That ticks full of blood from infectious Southern cattle, may, it seems, scatter the germs on our lands, though ticks *of themselves cannot* convey the disease." Here he is entirely wrong. Not only can ticks convey the disease themselves and directly, but ticks which are not full of blood can convey it. Our experiments prove that ticks which have never been on infectious Southern cattle can produce Texas fever, for we have produced it with young ticks which were hatched in the laboratory from the eggs of ticks gathered from Southern cattle.

How then does Dr. Paquin get the idea that ticks may carry the germs at all? Turning to page 45 of his bulletin we find the remainder of the story, and with this we have, I believe, his complete writings in explanation of the relation of ticks to the etiology of Texas Fever. He says: "That is not all; we have found the parasites also in *ticks bloated with blood of infectious Southern cattle*. So this must be added to the list of sources." Here we have the full explanation. In examining the contents of ticks bloated with the blood of Southern cattle he saw what he believed to be the germ of Texas fever. But how did he know that ticks would scatter this germ in a virulent condition on pastures? How does he know that what he saw was really the germ of Texas fever? No intelligent bacteriologist in these days pretends to identify such a micro-organism by its form alone, no matter how constant and unchangeable this may be. But Dr. Paquin asks us to believe in his ability to identify this germ under such unfavorable conditions as when it is mixed with the debris of partially digested blood corpuscles and the various micro-organisms which may normally be present in the digestive organs of the tick. This would be drawing heavily on our credulity under any circumstances, but when we look at his drawings and see that his germ is represented as a single coccus and a double coccus, a short thin rod

and a short broad rod, a long thin rod and a long broad rod, in fact as having about all the forms which ordinary putrefactive bacteria assume, we cannot possibly imagine how he could distinguish by microscopic examination between the germ which he thinks produces Texas fever and any of the ordinary bacterial species which are to be found all around us.

Now, it is the repeated instances of this kind in which Dr. Paquin assumes his ability to do what no modern bacteriologist would pretend to be possible under the circumstances, which has led some of his confreres to criticise his work and others to ignore it. In the discussion at the Chicago meeting, without for the moment saying who was right or who wrong, I asserted very positively that the germ described and figured by Dr. Paquin could not be the same as that we were working with in the Bureau of Animal Industry. The germs are radically different, and no competent person can look at the protozoon in the blood globules of Texas fever cases, and then read Paquin's description and consult his figures, and still believe that the Doctor had ever seen our germ at the time his bulletin was written. No matter whether he classified his germ or not, no matter to what kingdom of nature he assigned it, his text and his figures demonstrate conclusively that he was working with an entirely different kind of organism. Now, if it turns out that the disease is caused by the rod-shaped organisms which he described, and which can be cultivated on blood serum, on potato, in beef broth, etc., and which may be found in a motile condition in the blood, bile and other liquids, as he describes, then we will not contest with him the honor of having discovered the cause of the disease. But if, on the contrary, the germ is not rod-shaped, if it has no motility except the amœboid movements of the protozoa, if it cannot be cultivated according to the ordinary bacteriological methods, if it cannot be distinguished and identified by present methods of research outside of the red blood globules, then it is absurd for Dr. Paquin to assert that it is the same organism with which he worked and which he tried to describe in his bulletin. There are other points in the bulletin which have been, as Dr. Paquin says, ignored. These are notably his alleged identification of the germ in the surface soils, pond waters and grasses of the Southern States; his statement that germs just excreted from the animal body are not dangerous, but must have a resting period before they regain their

virulence; his identification of the germ in the organs of insusceptible Southern cattle from the infectious districts and in the organs of their calves before and after birth; his cultivation of these germs and the possibility of successfully using the cultures for preventive inoculation. In the first place, it is physically impossible for any man to have carefully investigated and decided all the questions, which he in his bulletin claims to have decided, in the few months over which his work extended. In the second place, several of his conclusions are extremely improbable when considered in the light of the present knowledge of germs and germ diseases, and are at variance with the results which we have positively established and which can be easily repeated by any one. In the third place, he admits that his bulletin was written for the general public and not for scientists, and that he purposely withheld the details of his methods of making and using his vaccine virus to prevent others for the present from repeating his experiments in this direction. Under such circumstances what right has he to complain if his work is ignored, until these questions are settled by scientists who are willing to publish their experiments with sufficient details to allow other investigators to repeat them and test the accuracy of the conclusions?

Washington, Dec. 19th, 1890.

D. E. SALMON.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

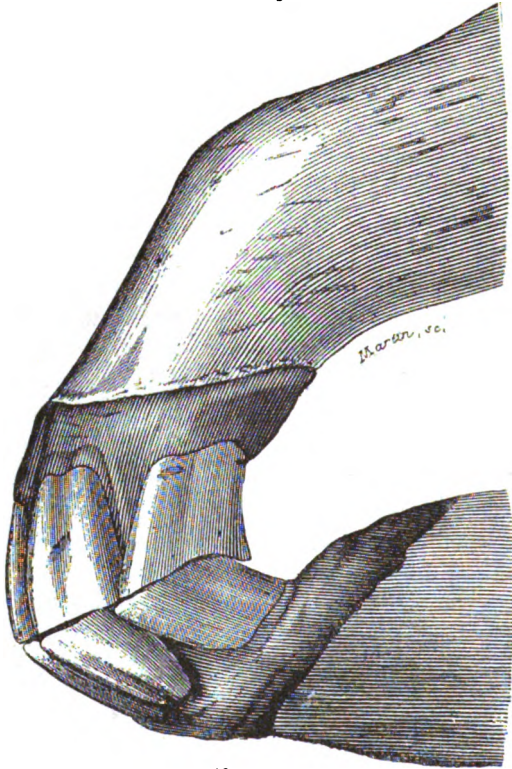
BY R. S. HUIDEKOPER, M.D., VETERINARIAN.

[Continued from page 709, Vol. XI.]

Fifteen Years.—FIG. 51.

From in front, the inferior teeth appear shorter than the superior, as the jaw has not been raised to the proper height; in profile, they are seen to be about the same length. The notch in the superior corner teeth continues. The inferior tables show in

FIG. 51.



Fifteen Years.

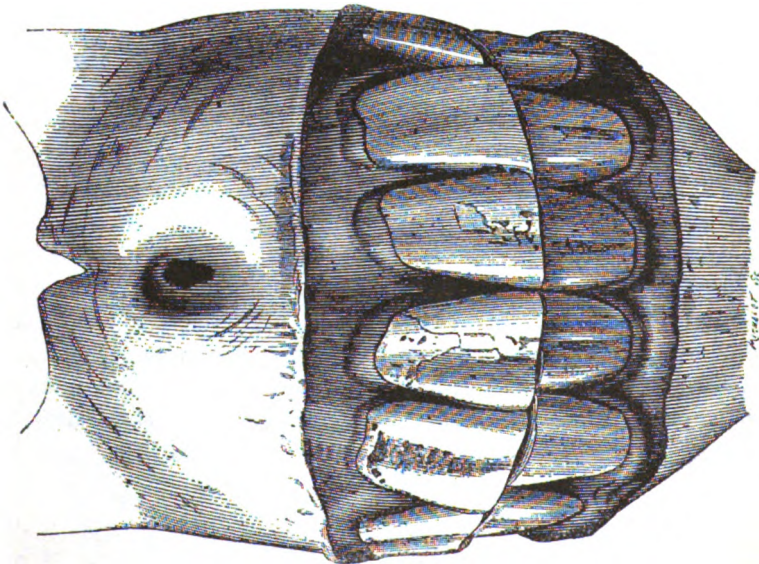
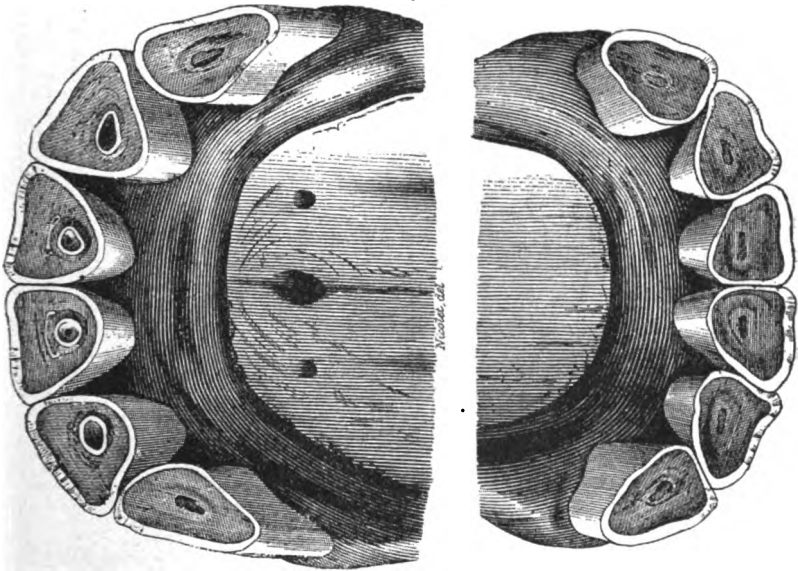
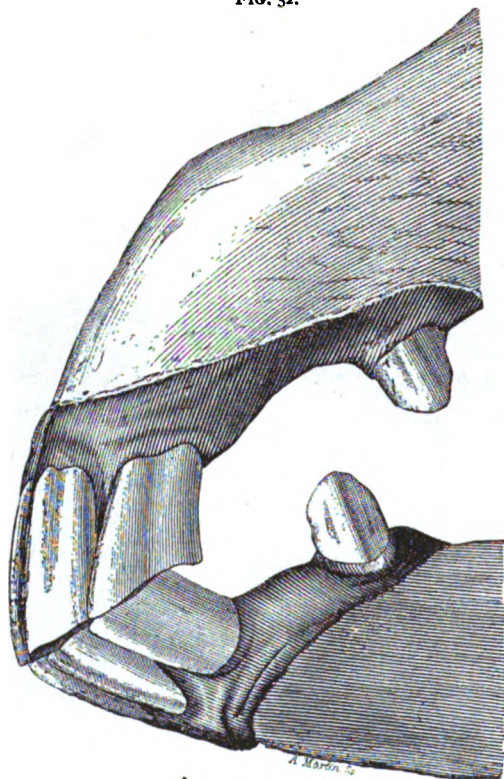


FIG. 51.



their centre a very decided, rounded dental star ; the pinchers are nearly triangular in shape ; the intermediate teeth begin to become so. The central enamel in the upper pinchers are much smaller than at thirteen years ; the incisive arch is depressed in front and narrowed transversely.

FIG. 52.



Seventeen Years.

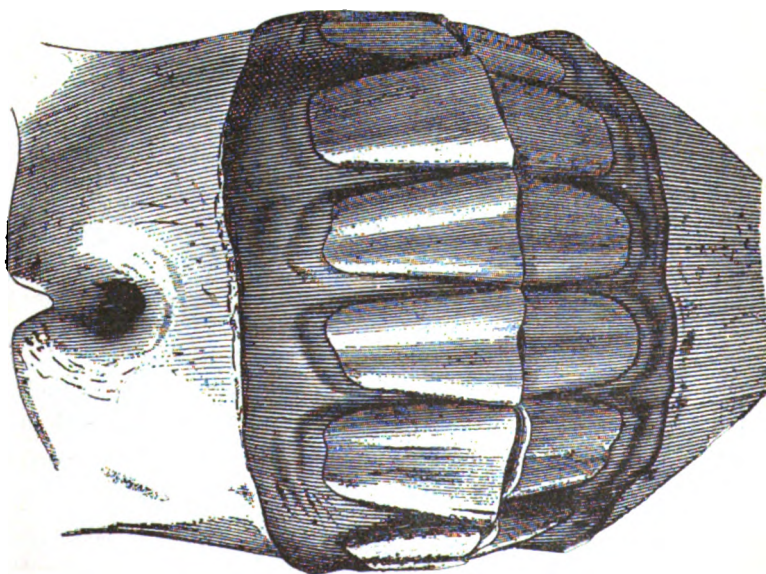
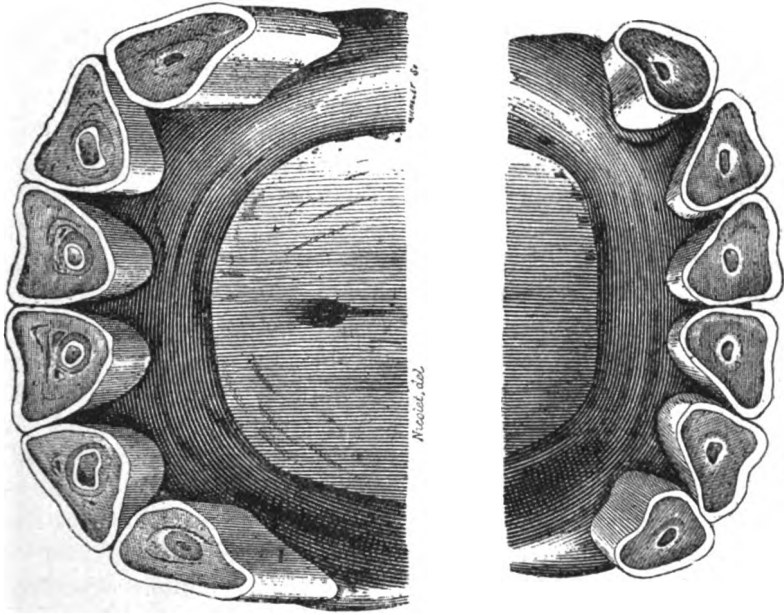


FIG. 52.



Seventeen Years.—FIG. 52.

In front, the superior corner teeth incline toward the centre. The line of apposition of the teeth is very oblique on the horizontal line. To see the inferior teeth distinctly, the head must be well lifted. The tables of the inferior teeth are all triangular; the dental star is in the centre and distinctly round. The inferior incisive arch is narrow, only slightly convex, and the teeth appear more separated from each other than at any previous period; the pinchers especially are separated from each other in the median line. The tables of the superior teeth are triangular; the cup of the pinchers has nearly disappeared.

[TO BE CONTINUED.]

HOW MUCH MORPHINE CAN A DOG STAND? CAN ARSENIC PRODUCE PARALYSIS OF THE LOWER JAW?

JOHN A. McLAUGHLIN, D. V. S.,
PROVIDENCE, R. I.

THESE are two questions I would like to hear discussed by members of the profession. The first question has arisen in my mind from the enormous amount I have given my own dog, a small collie, weighing probably twenty-five or thirty pounds, and the latter by three cases which have come under my professional observation, of which I will speak later.

My collie is about fifteen months old, quite a small one, and showed symptoms of acute gastritis due, I supposed, to a foreign (non-poisonous) body; she began whining and crying, became extremely restless, breathing short, mouth partly open and the mucous membranes of that organ injected. Large doses of oil, ipecac and opium succeeded, in the course of a week, in removing all symptoms, and when they remained absent for four or five days I felt justified in giving her a run. She was exercised for two successive days, and on the second the symptoms returned, not caused by exercise, I believe, but by another similar cause as her previous attack. The symptoms were the same, but much severer. I administered one-fourth grain of morphine without effect, ten or fifteen minutes later I gave one-half grain, and within fifteen minutes after the second dose I gave one and one-fourth grains, without a particle of effect. I bought an one-eighth ounce bottle, and making a solution of about two grains I injected it hypodermically. This quieted her. Twice during the night, and every time she began to whine and cry during seventy-two hours, I kept this treatment up, and found by actual weight I had fifteen grains injected subcutaneously; in the next twenty-four hours I administered four grains, per mouth, in one grain doses. My hypodermic syringe allowed some loss, and for this I will say instead of fifteen grains my dog received but ten grains, which amount she surely got. Here is a record of ten grains hypodermically and six grains per mouth in four days, and with only good, yes, wonderful results. Here was a dog with acute gastritis so severe as to render her countenance pitiful

to behold, so truly did it express the intense agony she was suffering ; the buccal mucous membranes injected to a dirty, nasty, dull brickish color, the tongue wrinkled, shrunk and parched, the breath horribly fetid, without any hope of recovery that I could see, showing the most favorable symptoms twenty-four hours after the last dose of morphine.

In the course of the last six months I have attended three cases of paralysis of the lower jaw. All three were brought to me under impression they had something lodged in the throat. My diagnosis of each was gastritis due to arsenical poisoning. My diagnosis in the first was verified by an examination by Dr. Heaton, who assisted me in the post-mortem ; the specimens of the second were lost ; and the stomach and intestines, and their contents, of the third are now under observation.

According to our authorities, paralysis of the lower jaw is a *sure sign of dumb rabies in the canine*, and Dr. Hill, who is an excellent and a clever canine practitioner, has held to the spontaneous character of the disease, mostly from this one symptom. Would it not be curious if *dumb rabies*, so called, was due very often to those 'thousand and one abominations, or godsend, whichever way you put it, with which we exterminate rats and other vermin, and which have, as a rule, arsenic as their exterminating base ?

I would like very much to hear the opinion of the profession on the subject.

EDITORIAL DEPARTMENT.

INSPECTION OF CATTLE AND SHEEP FOR EXPORT.

THE eleventh hour is better than no hour at all, and at last the United States Government has done something to meet the complaints of foreign nations in regard to our food animals, and the restrictions which they have placed against them.

By authority of Section 10 of the Act of Congress approved August 30th, 1890, entitled " An Act providing for the inspection of meats for exportation, prohibiting the importation of adulterated articles of food or drink," etc., Mr. Rusk, the Secretary of Agriculture, has directed the Chief of the Bureau of Animal In-

dustry to cause careful veterinary inspection to be made of all neat cattle and sheep to be exported from the United States to Great Britain, Ireland and the Continent of Europe.

The order and regulations provide for inspection and tagging of the animals, the cleanliness of all means of transport, the investigation of the origin of all cattle shipped abroad, and forbids the clearance of vessels with cattle, unless the latter are accompanied by the proper certificates of the Veterinary Inspector.

Dr. Charles B. Michener has been appointed Veterinary Inspector, Port of New York, and is conveniently established at 18 Broadway, New York. Dr. Michener has been granted rather more liberal power and facilities than we veterinarians are accustomed to expect. He is assisted by Dr. Henry Brister and Dr. Thomas H. Ash. Dr. R. W. Hickman has charge of the inspections at Chicago, where he has established two "shutes" in the stock yards for handling the cattle, and has a force of some eleven lay assistants. They have been obliged to handle over 1,700 cattle a day. The other inspectors are: Dr. Claris, Buffalo; Dr. Armstrong, Pittsburg; Dr. W. B. E. Miller, Philadelphia; Dr. Faville, Baltimore; Dr. Wm. Rose, Kansas City, and Dr. A. H. Rose, Boston.

At inland stock yards the cattle are inspected and tagged before shipment to the seaboard. At ports of export they are again inspected, the tags verified, and a certificate stating that the animals "have passed a careful veterinary examination, and so far as can be ascertained, they have not been exposed to any contagious disease," is furnished the vessel master before clearing. Dr. Wray in London is furnished with duplicate papers, and follows the disposition of the animals in Europe. While the regulations, so far, only apply to cattle and sheep, the act provides for the inspection of hogs and pork in such a liberal manner that we need not apprehend any future trouble for this much abused and maligned animal.

The step which this law, and these regulations make, toward a general inspection of our animal food, opens the doors to a good and valuable livelihood for a large number of young veterinarians, and must indirectly be of considerable importance and value to our veterinary schools, as well as to the welfare of the whole people.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION, AND IOWA STATE VETERINARY MEDICAL ASSOCIATION.

WE regret extremely that we are unable to furnish our readers with further information in regard to the meetings of the Illinois State Veterinary Medical Association, and the Iowa State Veterinary Medical Association.

Our first communications to the officers of these associations remained unnoticed, and when we wrote later, stating that we were holding our issue for their reports, we received no reply. We have since been notified that both Associations "by vote give exclusive use of its papers to 'The Review.'

We are sorry that our colleagues of Illinois and Iowa should seem to regard their mental productions, and any reports of their discoveries and experience in veterinary medicine, in the nature of a patent medicine, whose contents cannot be given to the public. No science, and less so veterinary medicine, is extensive enough to neglect any opportunity of advancing it, and we assure our readers that all matters of *value* will be placed before them *when it is obtainable*.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

As the duties of General Secretary have become so multiplied and onerous, it is desirous that in the future all committees and members of the profession desiring information or other matter pertaining to the Association will apply for the same through the Assistant State Secretaries. All those desiring to become members of the Association are recommended to apply through their respective State Secretaries, as their approval of their credentials will greatly facilitate the work of the Comita Minora. Blank applications for membership will hereafter be furnished, and must be properly filled and filed before an applicant's name can be considered. All future certificates of the Association will only be granted after the member-elect has filled and filed certificate of his willingness to sign and uphold the Constitution and

By-laws, a copy of which will be mailed with each certificate, that the members may become fully acquainted with the requirements of the Association.

It is earnestly desired that all members-elect who have not qualified, will do so on or before January 15th, 1891, as the new list of officers, committees and members will be placed in the hands of the printer at that date. Notice is given that no names will be placed in the list of qualified members save those who have complied with the requirements of membership.

RUSH S. HUIDEKOPER,
President.

W. HORACE HOSKINS,
Secretary,
12 S. 37th St., Philada.

SOCIETY PROCEEDINGS.

Proceedings of the Association for the Study of Comparative Psychology, in connection with the Faculty of Comparative Medicine and Veterinary Science, McGill University, Montreal, for the Year 1889-90.—This society met for the election of officers for the year, with the following results: Hon. President, Principal McEachran; President, Prof. Wesley Mills; First Vice-President, W. D. Smith, V.S.; Second Vice-President, Mr. Joel; Secretary-Treasurer, Mr. McGlua; Corresponding Secretary, Mr. Willyoung.

At a meeting held subsequently, the president in the chair, a large number of new members were proposed. The report of the retiring secretary-treasurer showed that the society had no debts, and that already a small amount had been expended in providing a nucleus for a library for the department of Comparative Psychology.

The inaugural address of the year was delivered by Prof. Charles McEachran. It was characterized by grace of style and excellence in manner of delivery, and was calculated to instruct, suggest and inspire. After alluding in general terms to the nature of the profession of veterinary medicine, he proceeded to show that a knowledge of the disposition and intelligence of animals was essential for the most successful treatment of these creatures when afflicted with disease. No one could become acquainted with the real nature of these animals without realizing that it was impossible to explain their mental manifestations and behavior by "instinct" alone. This position was supported by incidents that had either come under his own observation or that of trustworthy friends. Several groups of animals furnished these illustrations. One is so remarkable that it must be briefly retold. A gentleman in this city had two valuable pointers that were occasionally allowed the run of a back garden surrounded by a wall. One day, when thus enjoying themselves, the dogs entered the kitchen, and mani-

fested unusual uneasiness, and then ran out, shortly to return still more ~~anxious~~ to communicate, evidently, some important discovery. They whined and tried to coax the servants to follow, one of the dogs actually pulling at the apron of the maid. The servants were constrained to accompany the dogs, to find, to their astonishment, that the source of the excitement was a living infant that some one had left just inside the garden wall, well wrapped up. What but a complicated mental state allied to our own could explain the behavior of these dogs? The address altogether was a charming and instructive one.

The Honorary President, Prof. D. McEachran, then made some remarks tending to reinforce the position of the speaker who had preceded him. Among other instances of general intelligence and sympathy with our own state of mind, he alluded to the behavior of a horse he rode when on his prairie ranch last summer. This animal, naturally wild, easily frightened and high-spirited, on one occasion stumbled, and, falling on his rider's leg, had disabled it. The horse, on rising, ran off to the distance of a quarter of a mile. Principal McEachran, hobbling toward a stream not far distant, cut a stick to act as support and protect himself against the wild cattle. In a little time the horse, of his own accord, approached, allowed himself to be quietly mounted and to be ridden equally quietly homeward. Such an unexpected realization that something was wrong, and such a corresponding change in his whole demeanor, called for explanation. Unless that animals reasoned and drew conclusions by some mental process closely allied to that employed by human beings, it was not possible to explain their conduct. In this view the president also concurred, and after he had spoken of the bright future he saw before the veterinary profession, and of the improvement that must come in the lot of the domestic animals when better understood, the society dispersed, to meet in about three weeks.

A meeting of the society was held, with the President, Prof. Wesley Mills, in the chair. The attendance was large. The Secretary reported the interchange of publications with the Toronto Humane Society. Several new members were elected.

The first paper of the evening was by Mr. Darling, on the psychology of a dog, a cross between a mastiff and a St. Bernard. The dog seemed to display the qualities of both of these breeds, and his general intelligence was high. His disposition was good, though, as usual, it was not improved by confinement on the chain. The essayist illustrated how, in various ways, this dog, like ourselves, profited by experience. Some of these instances were striking. The dog was averse to entering the water at command, and could never be induced to swim, but, nevertheless, amused himself by fishing. He stood in shallow water, and caught the fish by a snapdash at first, but later rushed at them before they were so near, and thus missed many. The fish were chewed up, but not eaten.

The next paper was by Mr. Willyoung. The writer endeavored to establish certain principles in regard to the lower animals, distinguishing between instinct and reason, and illustrating the resemblance between the mental processes of man and those of some of our domestic animals as well

as of some wild ones. The case of a crow taken when young from the nest and tamed was surprising and interesting in the extreme. The bird's tongue had been operated on in some way, but exactly how was unknown. It learned to talk like a parrot, and displayed the feelings of jealousy, revenge, humor, etc., etc., in a way that was unmistakable. It was accustomed to express itself in both German and English. It had heard both these languages spoken in the family. This crow was accustomed to call the cows regularly and successfully at 5 o'clock.

Other animals were made use of to illustrate the writer's views.

A discussion was begun on these papers, but had to be postponed till the next meeting.

A meeting of the society was held, with the president in the chair. The attendance was good, and new members were elected. It was reported that several new works had been added to the society's library, and that others would be at once ordered from England.

Mr. Scott read a paper on animal intelligence, illustrating his views by such animals as the horse, the ox, the cat and the dog. Special attention was called to the power of discrimination, the retentiveness of memory and the appreciation of kind treatment shown by the horse. A horse has been known to recognize a man who had treated him harshly after years of separation. The writer of the paper referred to a certain horse that could distinguish between the sound of a locomotive whistle and that which indicated the noon hour and 6 o'clock, though they were very similar. This horse also objected to working over-time. Mr. Scott thought that the bovine species, especially bulls, possessed more intelligence than they usually got credit for.

The question of the intelligence of dogs, as evidenced in their cunning behavior when engaged in sheep worrying, and before and after it, led to considerable discussion. The general conclusion was to the effect that the dogs that usually worried sheep were not thoroughbreds of any variety, but mongrel dogs—canine tramps, in fact.

The president instanced the case of a dog cruelly left behind when the family moved away, that, to support itself, paid regular visits to the hen-roosts of the vicinity, and helped himself to the fowls.

Fowls supposed to be killed by foxes were sometimes, in reality, killed by these prowling dogs. Such dogs should be destroyed. They brought the whole canine race into disrepute with the undiscerning. Taxing dogs was but a crude way of regulating the dog nuisance. Thoroughbred dogs should, for many reasons, be exempt, while vagrant curs should be destroyed.

The whole canine race should no more be held responsible for the doings of its worst members than the whole human family for the behavior of the criminal classes. For both alike, civilization was responsible. The dog, above all, is what man makes him. The individual that breeds and trains high-class dogs (or animals of any kind) is doubly a benefactor. He renders the excuse for keeping curs less valid, and he furnishes what is worth having. It was the duty and the privilege of the society to diffuse such views.

Discussion on the paper of the previous meeting was resumed.

One of the members related a remarkable instance of intelligence in a mule. This animal had been employed to draw a car loaded with coal from the mine to the dump. He was usually unhitched there, and being replaced in position drew back the empty car. On one occasion he had accidentally got free, and after taking a drink from the river near by returned and pushed the car before him with his breast. After this he was used regularly for work in this way.

The President finally gave some hints as to the anatomy and physiology of the nervous system, which he thought would assist in making the whole subject of animal intelligence more scientific and comprehensive.

A meeting of the Society for the Study of Comparative Psychology was held in the lecture room of the Faculty of Comparative Medicine and Veterinary Science, the President, Prof. Wesley Mills, in the chair.

The executive reported that a new form of diploma would be prepared to suit the change in the relations of the school to the university of which it now was a faculty.

The first paper of the evening was read by Mr. Crossman, entitled "Instinct and Reason." The writer thought that no one who studied the development of an intelligent dog from puppyhood to maturity could believe that he was guided only by instinct. "If all the philosophers in the world should try to convince me, I should never be able to persuade myself that an animal is a mere machine." The position taken was illustrated by instances that came under the writer's own observation, especially in the horse. He instanced the case of a mare that used to let down bars in order to get into an adjoining field. This required more than instinct, and it could not have been by instinct that her colt learned the same thing from its mother, for instinct implies action independent of experience or comparison. The mother did not soon forget the habit, but proceeded to let down the bars at once after a year's interval. The paper was evidently the result of independent observation and thinking.

The next paper, by Mr. Walsh, was on a similar subject, but the handling was somewhat different. This writer discussed incidentally the senses in our domestic animals, in races of uncivilized men and in the man of the most advanced civilization, showing that in the latter certain senses, as smell, have undergone a partial impairment from disease, owing to the necessity for them being less urgent. Mr. Walsh proceeded to show how unfavorable in most cases circumstances were for the development of the higher mental and moral qualities of animals, owing to man's neglect or positive ill-usage. It was of no small importance to breed from animals that showed the best disposition and the highest intelligence.

The influence of one animal over its companions was then illustrated by several forcible examples, showing that in this respect they were wonderfully like ourselves. Both the papers were calculated to produce a better feeling toward our dumb companions and a more moderate estimate of our own powers.

The discussion was so free that the evening did not suffice to finish it.

Several members illustrated the intelligence of animals by their ability to let down fences, notwithstanding many mechanical contrivances, and it was seen that the habits of animals were, like our own, capable of being very strongly fixed. One of the members related the case of a Collie dog that used to open a door to enter the house. He was told on one occasion to go back and shut the door. This he did, and continued to do so of his own accord always afterward. It was pointed out that certain acts in the lower animals were the result of instinct primarily, but as modified by intelligence; in fact, that there is much in the mental life of man of the same character. The president referred to the interest he found attaching to the study of the different dogs in his own kennel, and especially in noting the individuality of each, and, at the same time, the modification of each one's character by the other. An ill-behaved dog would spoil to a degree a whole kennel, just as a bad boy in a school may lower the tone of a whole class. And in every kennel the strong characters among the dogs made themselves felt even in puppyhood. He was accustomed to have his dogs' sense of right and justice cultivated. No dog was ever allowed, under any circumstances, to take another's food, his bed or even his bone. The dogs soon learned to respect each other's rights independent largely of might.

The next meeting of the society was held in the usual place, the president in the chair.

Mr. Scanlan read a paper, in which he maintained that the behavior of our domestic animals could not be explained by instinct alone, but that their actions showed that with instinct we must recognize that intelligent adaptation which implies the power to draw inferences and profit by experience. These animals seemed also to experience feelings closely akin to our own. The writer advanced facts that had come under his observation in the case of the horse, the dog, the cow and the cat. These recitals were all pertinent and convincing. The case of a dog that feigned sleep after stealing from the kitchen, and so successfully as to escape detection until watched and caught in the act, was clear evidence that instinct alone could not explain the action of animals. The writer stated that he had a friend who, when studying at the Conservatory of Music, observed that a certain spider always left its web and descended to near where he was when playing the violin. Two cats that at first opened the door accidentally, when attempting it together afterward acted regularly in concert to accomplish this purpose.

The president here stated that he had an Irish setter which, when a puppy of seven months, would open nearly all kinds of doors when anxious to get out to follow older dogs, and used a great many devices to effect this.

A paper was read by Mr. Hayman, entitled "Our Dumb Companions; their Intellect and Treatment." He contended that the best way to advance the interests of dumb animals was to make their nature understood. In conclusion, he said he had always found that kindness, patience and good temper had their reward in dealing with both man and the lower animals.

The discussion was animated, and had to be postponed for continuation at the next meeting.

The president asked those who had had most experience with balky

horses to state their views, with reasons, on the question : Are balky horses less or more intelligent or sensitive than others?

This subject was discussed with much point and clearness. The general impression was that there are different kinds of balky horses, some very stupid and stubborn, others more than usually intelligent, and others that were highly nervous and easily discouraged. All seemed to agree that much depended on the driver and the treatment the animals received.

The president suggested that it would be greatly in the interests of the horses themselves, and also the public that this subject should be dealt with in a paper and be fully discussed before the society at some future meeting.

The last regular meeting of the Society for the Study of Comparative Psychology was held in the lecture room of the Faculty of Comparative Medicine and Veterinary Science, with the President, Prof. Wesley Mills, in the chair and a large attendance of members.

The first paper of the evening, by Mr. McGue, the case of a Gordon setter dog, elicited some discussion and gave rise to many questions. This dog belonged to a gatekeeper on a line of railway. He was accustomed to wake his master, who was required to be on duty early every morning. The animal would lie with his head on the rails, and seemed to be able to recognize the approach of a train at a great distance ; and this was the more singular as he was slightly deaf, and had for that reason been discarded as a hunting dog. He also had learned to know the trains that stopped from those that did not before they came into view, and behaved accordingly.

Mr. Barton read a paper entitled "Reasoning Power in Animals." The paper showed that various authors had been studied and carefully compared by the writer, and though somewhat lacking in originality, it embodied a good discussion of the subject. The distinction claimed for man, that he alone is capable of true reflection and of self-consciousness was considered, also Max Muller's dictum that thinking is only possible through language, and that, therefore, man alone could be said to think.

The president pointed out that Max Muller's position was a begging of the question. No doubt man was capable of a kind of thought of which no other animal could give evidence. At the same time it was to be borne in mind that the greater part of man's thinking was not in the abstract. He believed that for the mass of men a large part of their thinking, if such we are to call it, was in images, without the use of languages at all, and by rapid inference, in which we resemble our dumb companions, though in rapidity of inference they often excel us, as is admitted by Max Muller himself.

It was likely, he said, the Gordon setter, being rather deaf, availed himself of the vibration of the earth and the rails to learn by contact of the approach of trains. By the law of association these two things had become fixed in the dog's organism, and were revived simultaneously in his consciousness. In such respects the nature of the lower animals and man do not differ essentially. All animals think within the limits of their experience.

After some further discussion and hints from the president as to summer study, the society adjourned.

Keystone Veterinary Medical Association.—The Keystone Veterinary Medical Association held its regular meeting at the College of Physicians, Philadelphia, December 6th, 1890, the president, Dr. Hoskins, in the chair. Present: Drs. Zuill, Glass, Hoskins, Huidekoper, Kooker, Williams, Eves, Harger, Ridge, Lusson, Magill, Birch, Drake and Landes. Minutes of the November meeting were read and approved. The board of trustees had failed to hold a meeting and had no report to make. Dr. Hoskins, for the legislative committee, reported that the attorneys of the association had been instructed to draft the necessary amendments to cover the deficiencies in the present act regulating the practice of veterinary medicine. Dr. Zuill, for the committee on essays, suggested for debate: I. Should the refrigerant treatment be used to combat inflammation? II. Should veterinarians furnish their own medicines? III. Should veterinary colleges give free treatment to the owners of animals in poor circumstances?

The resolution limiting the business meetings of the association to four in the year, was brought up and amended to read that the business meetings be limited to the September, December, March and June meetings. After discussion by Drs. Glass and Williams, the resolution was put to vote and lost.

Dr. Ridge presented the name of Dr. Schrieber, and Dr. Hoskins that of Dr. Sellers for membership. The essayist, Dr. Vandegrift, was absent. Dr. Ridge presented a paper on "Pneumonia." He reviewed the etiology, pathology and treatment of the disease. He dwelt on the statement made that pneumonia does not relapse. Dr. Birch reported a case of abscess following four days after a hypodermic injection of morphia, which was followed in ten days by tetanus.

Dr. Huidekoper presented an abstract of Koch's discovery of a cure for tuberculosis. He doubted if it would prove of value in veterinary medicine, as in animals the predisposing constitution would remain in the animal, and the consumer would be as suspicious of the milk and beef of a cow that had been cured, as he would be of the diseased animal. On discussion of Dr. Birch's case of tetanus, Dr. Huidekoper cited several clinical cases in support of the theory of contagion of the disease. Drs. Glass and Kooker stated that they had not had succeeding cases in the same stables, and doubted its contagiousity. Dr. Landes reported that he had been experimenting for some time with cultures of discharges from the wounds in cases of tetanus. He had discovered a micro-organism, bacillus, which would not grow in the presence of oxygen; it grew at the temperature of the room; his experiments were not complete, but he believed he had found the cause of the disease. He would report at a later time. Dr. Lusson reported a case of a runaway horse which collided with a granite post six feet high and three feet square. The post, which probably weighed several tons, was knocked from its base and broken in two; the horse fractured its sternum and had to be destroyed. Dr. Hoskins reported a case which had been under his care from May 26th, 1888, until November 8th, 1890. It had from time to time shown symptoms, for a few days, resembling an attack of influenza. The autopsy showed a massive cyst in the lumbar region, surrounding diseased ovaries. It had never exhibited enlargement of the abdomen or symptoms of intes-

tinal disturbance. Dr. Ridge recalled the similarity of the symptoms of this case with the one of mesenteric abscesses, which he had reported several years ago.

Dr. Zuill demanded that the charges against him be considered. Dr. Hoskins stated that no charges had been made, that his resolutions presented last month were in regard to the University of Pennsylvania, and were not charges. Dr. Zuill insisted that charges had been made. Dr. Hoskins then called Dr. Ridge to the chair and presented the following :

December 6th, 1890.

To the Board of Trustees of the Keystone Veterinary Medical Association :

I beg leave to request your opinion as to the legality of a member of this Association holding a position on the staff of the Veterinary Department of the University of Pennsylvania, so long as that institution assumes the present position of offering free services to all who may apply.

Respectfully submitted,

W. HORACE HOSKINS.

The communication was referred to the board of trustees.

Dr. Huidekoper requested that the board of trustees would not delay in acting upon Dr. Zuill's charges against him.

The president appointed Dr. Birch to act in the place of Dr. Harger on the board of trustees, when the charges against the University of Pennsylvania are brought before that board, and instructed the board to meet before the January meeting. Adjourned.

C. H. MAGILL, *Secretary.*

Long Island Veterinary Society.—A regular meeting of the Long Island Veterinary Society was held on Wednesday evening, December 17th, 1890, at 8 o'clock, at No. 74 Adams Street, the President, Dr. George H. Berns, in the chair.

The following members were present : Drs. George H. Berns, George F. Bowers, J. F. Mustoe, Philip Newman, Thomas M. Buckley, Samuel Atchison, D. S. Breslin, William H. Pendry, Roscoe R. Bell, George G. Vanderveer, Charles Jamieson.

The minutes of the previous meeting were read and approved.

The Treasurer, Dr. George F. Bowers, read his report for the term ending January 1st, 1891, the report showing a balance of cash on hand of \$44.83. The report was received and adopted. The Board of Censors and the Board of Trustees had no report to make.

Dr. William H. Pendry was instructed to file the yearly report of the society's condition in the county clerk's office, thus complying with the law on the subject.

The next order of business being reading of papers, Dr. William H. Pendry read an interesting paper entitled "Uniform Standard of Veterinary Education," as follows :

UNIFORM STANDARD OF VETERINARY EDUCATION.

In selecting a subject for your consideration this evening I may possibly disappoint some of those who have a more practical turn of mind; yet the

question submitted I consider one of the most vital to the profession, and it deserves your full and most serious attention. Some few years ago I tried, in a rough way, to bring about a discussion on veterinary education, but very imperfectly succeeded, for what reason I do not know; perhaps it was that comments might have added a further blur to the poor opinion that many have of some graduates, whose very diversity of knowledge lends color to the impression that the common educational ability has a remarkably wide range. Why this condition of affairs? Why this silent taunt at so noble and so scientific a profession whose field of usefulness and work has such an immense range, is hard to conceive. Doubtless the vast difference between an ordinary veterinary surgeon and an educated veterinarian is as yet beyond the comprehension of the general public. As a rule, the one's usefulness is limited to his particular line, the other knows no bounds in the field of his profession, whose extensiveness lies beyond the imagination of an ordinary mind, and can only be conceived by an ideal realization or a scientifically educated person. How often do those who are loyal to their profession become disgruntled with their own knowledge and absolutely disgusted with that displayed by others! Do not imagine that I here intend to start out on a crusade against the different schools of this or any other country, in contending that this one or that one has turned loose those who have helped to germinate such an idea as the foregoing. Yet I cannot refrain from saying, generally, that therein *may* lie some of the cause; still, I consider there is a more direct cause in that I believe that the existence of so many veterinary schools—and how many have sprung up within the last ten or fifteen years, either as an appendage to other institutions, or even veterinary colleges dependent upon their speculative results—has created a dangerous competition. And so much has this been the case that in many instances there has sprung up such rivalry that that very spirit, if left alone to run its own natural course, which lies so close to the crater that the slightest volcanic eruption might bring down such a shower of public contempt that the profession would be buried more deeply than Pompeii. As I have stated, I do not wish to assail any particular school, but simply desire to deal with the question in a general way; yet it cannot be denied where one offers to produce graduates for a less fee and in less time, the latter being often of greater moment to the interested party than the actual cash paid down. There must be some difference in that which is tendered for a consideration, not but what I am perfectly willing to admit that there are exceptions even to this rule; as some seem more adapted for their calling, coupled with a desire to increase their knowledge at every opportunity. But this, I claim, is the exception, and I am sure that a large majority of young graduates will answer—perhaps in silence—a conscious inquiry, is his knowledge consistent with a truly educated veterinarian, in the negative. Yet so many are satisfied if after leaving school they can, under the shelter of a diploma, treat a punctured wound of the foot, a case of colic or even diagnose a case of lameness; and this ends their ambition. Are such men true representatives of a profession that can be made one of the most scientific under the sun? Surely there must be times when such men feel within themselves and realize their inefficiency. The writer is free to admit that

many times he has exclaimed to himself that he did not know a thing; the last word being preceded by an emphasis that was somewhat unparliamentary. Yet he is a reader and more or less studiously inclined. This is said with no reflection on his Alma Mater, for whom he has the most profound regard; but I do say without any hesitancy that the course, as generally given in the colleges of the present day, is not on a par with the importance of the profession. This is bad enough, but even this wrong is lost in significance when compared with a greater one—the desire to turn out large classes. When I speak so reflectingly I am not unmindful of the fact that in no country has the veterinary profession made greater strides than in the United States during the last twenty-five years; yet our success must not submerge our judgment when certain reformation is called for by reason of circumstances that even might be attributed to such advancement, and which is born of a desire to too quickly show results in too short a time. I realize that these views may be considered selfish by those who have limited means and time, who doubtless are making great sacrifices to join our profession, with the determination to do it honor. Such a condition of affairs, brought about by such circumstances, finds no keener sympathizer than the writer, and it is to such men that I would do honor by protecting the profession they have chosen by raising them and it to a higher plane. How is this to be done? My answer is, by having a uniform standard of education. And how shall that be accomplished? For a solution of that problem let me refer you to the proceedings of the United States Veterinary Medical Association recently held in Chicago. Not that the idea of a National Board of Veterinary Examiners was conceived there, it having been written upon and talked about years ago, but that it received its first serious consideration at the hands of a large representative body of veterinarians; and it is seriously hoped that the fruits of such conception will quickly come to light and produce a healthier state of affairs. Now comes the difficult part of the problem; what authority shall create that Board and how great shall be its power? If the plan were only to be carried out in one State, it would be much easier; but it would avail nothing if the movement was not a National one. The idea of having examiners appointed by the Department of Agriculture in Washington is undoubtedly a good one, yet I have no doubt that some will be afraid of politics creeping in; but safeguards could be easily thrown around such a Board by adopting the same plan that is employed in the formation of the Board of Elections. So far so good; but how about the conflict of State authority? Certain colleges in certain States have been invested by charter or otherwise with authority to grant diplomas and to create a National Board of Examiners, who alone shall have that authority. This would conflict with State laws. Yet, if they cannot be deprived of this power, I see no reason why a National Board of Examiners cannot be created to be known as the Veterinary College of America, whose function alone shall be to grant diplomas to such graduates of the different colleges who shall pass a post examination before them, the value of which would be so established that all others would soon become professionally obliterated.

No time should be lost in having a bill introduced in Congress creating such a body and investing them with authority to hold examinations twice

a year—say one in Chicago for Western schools, and one in Washington for those in the East. I think such a bill would receive little or no opposition, provided it did not directly deprive schools of the graduating power already invested in them. The value of the profession to the nation has too recently been demonstrated not to receive the support of the Government when it can be positively asserted that the success or non-successes of the cotton industries of this vast country depend very largely upon the proficiency of its veterinarians, saying nothing about the relationship of the profession to public health in regard to the consumption of meat and milk.

I have not had the time to give this subject that it so justly claims; but, short as this paper is, and crude as the ideas and comments are, I trust they will be the means of starting a discussion that may lead to something tangible.

An interesting discussion followed, participated in by Drs. R. R. Bell, George H. Berns, J. F. Mustoe, George F. Bowers, Thomas M. Buckley and William H. Pendry, after which a hearty vote of thanks was tendered to the essayist.

The election of officers being next in order, the following gentlemen were elected to the various offices for the following year: President, Dr. R. R. Bell; First Vice President, Dr. Samuel Atchison; Treasurer, Dr. George F. Bowers; Secretary, Dr. D. S. Breslin; Board of Censors, Drs. George H. Berns, Philip Newman, H. Housman, Thomas M. Buckley, J. F. Mustoe.

Bills for type-writing, stationery and postage, amounting to \$4.10, were ordered paid. A vote of thanks was unanimously tendered the retiring officers, particularly the President, Dr. George H. Berns, for their efficient services in behalf of the society.

The chair appointed as essayist for January meeting Dr. George V. Vanderveer.

The meeting then adjourned.

D. S. BRESLIN, D.V.S.,
Secretary.

Massachusetts Veterinary Association.—The regular meeting was held at No. 19 Boylston Place, Wednesday evening, November 26th, 1890.

Presiding officer, President Thomas Blackwood. Members present: Drs. Blackwood, Emerson, Ferguson, Hadcock, Howard, Marshall, Winchester, Billings and the Secretary. Honorary member, Dr. Stickney. Essayist, Dr. E. C. Becket.

Minutes of last meeting read and accepted. There was no new business. The next in order was the reading of a paper by Dr. Becket upon "Surgical Treatment of Recto-Vaginal Fistula." The paper consisted chiefly of the notes of two cases of recto-vaginal fistula treated at the Harvard Veterinary Hospital, on Village Street. The essayist said that the cause was generally parturition, and was often complicated with rupture of the perineum, including a portion of the sphincter ani. He then described the two cases referred to above. Both were complicated with tear of the perineum, although one was much worse than the other. They were much benefited by treatment, the fistula being closed; but it was impossible to

bring about repair of the sphincter and in either case. Consequently, in going down hill the gut would fill with air until they had a bloated appearance, and this would pass off on level ground, together with more wind, rendering them disagreeable to drive. The treatment consisted in freshening the edges of the opening between the rectum and vagina, and bringing them together with sutures, silver wire being mostly used. It was found best to operate by throwing the mare and then etherizing. The animal, when under the influence of ether, relaxed the parts, and thus rendered them more accessible. The intestines should be as empty as possible before operating, and kept quiet as long as possible afterward, to avoid disturbance of the parts by the passage of feces. Both cases required to be operated upon two or three times before success was attained, and then it was only partial on account of the torn sphincters. The essayist thought that in cases of recto-vaginal fistula, where the perineum or sphincter was not injured, that treatment would be attended with success.

The ensuing discussion followed the reading of Dr. Becket's paper.

Dr. Winchester said that he had seen a few cases of recto-vaginal fistula, but all were in mares worth from \$2.50 to \$10.00, generally in the hands of cheap traders. He had tried operating, but with very little success. He spoke of Becket, in his paper, writing that the wall of the fistula was treated as one tissue, while anatomically it was two. Why would it not be better to try and separate the two walls, and sew each one by itself? Dr. Winchester appreciates the difficulty of doing this, but why would it not be doing the work more correctly to sew the rectal and vaginal walls separately?

Dr. Howard thought that in an old lesion it would be almost impossible to separate the walls of the intestine and vagina.

Dr. Marshall moved that the essayist be accorded a vote of thanks for his paper. Seconded; carried.

Moved by Dr. Winchester and seconded by Dr. Hadcock, that the secretary cast one ballot for Dr. Becket's admission as a member of the Association. Carried. Dr. Becket is accordingly elected.

Dr. Ferguson spoke of a case of deafness in a horse caused by firing a carbine close to his head. Blistering around the base of the ears was first resorted to without success, then treatment by electricity was tried with successful results in the course of a week.

Dr. Hadcock reported a case of rabies in a horse belonging to the West End Street Railway Co. In August last, a dog ran into a blacksmith's shop at Mt. Auburn, and bit a dog and the horse. Both dogs were killed at the time, and the horse worked as usual within a few days, when he began to show symptoms of rabies, soon becoming very violent and dying in less than twenty-four hours of the time when the first symptoms were noticed. The horse died in just three months and sixteen days from the time he was bitten. The brain and a part of the spinal cord were removed and sent to Dr. Jackson, at the Harvard Medical School, for the purpose of inoculating some rabbits in order to confirm the diagnosis of rabies. A general discussion of rabies followed, in which Drs. Marshall, Stickney, Winchester, Ferguson and Billings took part. Dr. Billings said that he was very skeptical about many cases we call rabies being rabies, and said that he did not be-

lieve in the rabies of Pasteur. He said that he had no faith in Pasteur after he persisted in keeping the "Newark children" among his statistics of patients treated after being bitten by a rabid animal, when he had been informed that the dog which bit them never had rabies. He then spoke of his rabies among cattle in the West, in which he separated a germ that would again produce the disease, but it was not altogether like rabies after all. Dr. Billings will not believe in the work done on rabies until the disease is produced by inoculation in dogs, and the dogs produce the disease in other dogs by biting them. He is also very skeptical as to the value of inoculation against a disease which has always been fatal, with no history of recovery and non-recurrence.

Dr. Winchester was appointed a committee of one to attend to inviting Dr. Van Schaick, of the Pasteur Institute in New York, to be present at one of the meetings of this association this winter, and give an address upon "Rabies."

A motion was made, seconded and carried, that we omit the December meeting, as the fourth Wednesday in December this year would bring the meeting on Christmas Eve.

Meeting then adjourned.

AUSTIN PETERS,
Secretary.

VETERINARY COLLEGE NOTES.

Ontario Veterinary College.—The Christmas examinations of this institution were closed on Friday, December the 19th. They were held in the examining hall of the new College on Temperance Street, Toronto, and were conducted in the usual vigorous and impartial manner. The Board of Examiners are appointed by the Agricultural and Arts Association of the Province of Ontario.

The Examining Board of this College ever since its inception in 1866 has been a duly recognized and properly appointed body of professional men. And the high standing which its graduates have attained are indications of the value of the teachings which they have received at the College; also of the vigorous nature and impartiality of the final examinations.

The following is the result :

THE GRADUATING CLASS.

T. F. Arnold, Lewistown, Mo., U.S.; L. F. Baldock, Mount Charles, Ont.; J. H. Cornell, Lambeth, Ont.; Newton Cossitt, Brockville, Ont.; D. Culham, Sheffield, Ont.; John M. Currie, Mitchell, Ont.; J. C. Faughnan, Bodines, Penn., U.S.; W. J. Fleming, Millhaven, Ont.; James R. Frank, Strathroy, Ont.; R. G. Gilmour, Almonte, Ont.; James Harrison, Fergus, Ont.; George M. Hodgins, Lucan, Ont.; S. T. Holder, Bloomington, Ont.; James A. Kelley, Orono, Ont.; Samuel Kennedy, Rupert, Quebec; William Leslie, Northport, Ont.; Lyman D. Lockwood, Pennyman, N. Y., U. S.;

Adam McMillan, Carberry, Man.; Seth Mathers, Markdale, Ont.; W. D. Miller, Findlay, Ohio, U. S.; John F. Milne, Clinton, Ont.; A. Morren, Minesing, Ont.; R. J. Nelson, Paisley, Ont.; L. N. Patterson, Oakville, Ont.; C. L. Peck, Beamsville, Ohio, U. S.; Charles Pink, Ottawa, Ont.; W. H. Simon, St. John, New Brunswick; J. Steiner, Bergen, N. Y., U. S.; A. E. Taylor, Brampton, Ont.; John H. Teller, Simcoe, Ont.; N. Thomson, Toronto, Ont.; George N. N. Wilkins, Baysville, Muskoka, Ont.

PRIMARY EXAMINATIONS.

Frank Barnes, *Materia Medica*; D. Lewis, *Materia Medica*; John B. Sowers, *Materia Medica*.

REVIEW DEPARTMENT.

ARE THE EFFECTS OF USE AND DISUSE INHERITED? AN EXAMINATION OF THE VIEW HELD BY SPENCER AND DARWIN. By William Platt Ball. Macmillan & Co. London and New York. 1890.

Perhaps there is no feature in the theory of evolution more fascinating than that which concerns the transmissibility of individual characters, whether congenital or acquired. We love to consider that, to a great extent, the destiny of posterity is in our hands, and that as one generation shapes its conduct and its actions it will proportionately determine, in the same direction, the conduct and actions of many generations destined to live after it. We imagine to ourselves that we are the necessary product of those who preceded us 500 years ago, and that as our early progenitors lived and acted, as they kept their lives within the bounds of reason and moderation, or gave free rein to their passions, they impressed those traits of character on those who came after them, so that, by a species of reversion, corresponding vices or virtues cropped to the surface. But the author of the extremely suggestive volume we are reviewing rejects this pleasing doctrine so far as acquired traits are concerned. He admits, indeed, the plausibility of the doctrine and approaches its discussion with diffidence, as it has received the sanction which such names as those of Darwin and Spencer could not but assure even to a less tenable opinion. These scholars hold that acquired peculiarities impress themselves on the reproductive elements, and are thus transmitted to posterity. But, as our author well observes, if such transmissibility of acquired habits, modes of thought, tastes, proclivities, etc., were actually realized, it would be possible to modify the race profoundly and at once, and we would seek to improve its moral character by a judicious system of stirpiculture rather than by the inculcation of moral precepts. Much of the confusion that surrounds this question has arisen from the tendency to mistake congenital peculiarities, the result of natural and sexual selection, with peculiarities acquired during the lifetime of an individual. Actual experience and observation cannot aid us in the solution of the problem, since changes that are due in reality to general selection (natural, acquired or sexual), are equally dependent for their accomplishment on infinite lapses of time.

The author chiefly addresses himself to a refutation of the arguments employed by Herbert Spencer in support of his opinion as to the transmissibility of traits lost or acquired by use or disuse. The chief of these acquirements is that borrowed from the more powerful jaws of negroes and Australians, a peculiarity supposed to result from increased use employed by those savages in rending their coarse and unprepared food. But, our author remarks, why should this increased osteosity extend to the rest of the Tasmanian and African crania? Surely it is not that the occiput and sinciput of the savage has ever been brought into more active use. We must consequently look for another explanation of the lighter jaw of the civilized European, and it is most probable it may be found in natural selection. "Human preference, both sexual and social, would tend to eliminate huge jaws and ferocious teeth when these were no longer needed as weapons of war or organs of prehension." Besides, as against Mr. Spencer's position, it may be stated that the excessive heaviness of the jaw is not a uniform feature of the skulls of savages, as it should be were increased use an efficient cause of an abiding change. We have given this synopsis of Mr. Ball's arraignment of Herbert Spencer's doctrine in order to show in what manner he himself explains changes which the great apostle of evolution sets down to the operation of use and disuse. With Mr. Ball natural selection is all potent for the explanation of structural changes and the functional peculiarities that ensue. Thus, in regard to lap-dogs, artificial selection with a view to gentleness, would account for the enfeeblement of the whole biting apparatus without suggesting disuse as its cause. Perhaps the most frequently quoted instance of the influence of use is that of the giraffe. In the case of this strangely constructed animal it is not at all necessary to have recourse to the hypothesis of use-inheritance, since its phenomenal length of neck may be more naturally accounted for by the law of natural selection that enabled the tallest of the species to survive a period of famine and so transmit a selected peculiarity to its descendants. The author pursues the same line of argument in the chapter on "Æsthetic Faculties," and conclusively proves that here use-inheritance cannot be invoked as an explanation of the possession of this faculty in its higher forms. In respect to musical aptitude, it is remarkable that the appreciation of harmonious sounds is enkindled at a very early age in those who develop extraordinary musical tastes and capacities out of all proportion to ancestral acquisitions. Sexual selection is the most important factor that prevails in the development of musical tastes, since it is a well-known fact that persons possessing this æsthetic faculty are even more powerfully attracted toward each other than by beauty of face and figure.

What we have hitherto noticed in Mr. Ball's interesting monogram has reference to the supposed effects of use in developing racial peculiarities; and we have seen that he considers positive selection, both natural, sexual and artificial, as affording a suitable solution of the difficulties which the Spencer and the Lamarckian evolutionists have endeavored to explain by a reference to use-inheritance. But the negative results of disuse are equally valuable in supporting the position Mr. Ball has taken. Thus, in the case of the reduced wings of certain birds that inhabit oceanic islands, it is easy to account for this peculiarity without having recourse to the disuse theory.

It is not at all unlikely that in the course of a given migration a few birds of feeble wing structure barely succeeded in reaching those islands, and were compelled to stay there in consequence. Then the law of natural selection went into operation, and adaptation to environments began. In general, then, the elimination of useless organs is a consequence of that inexorable law of nature which continually tends to establish an equilibrium between organism and environment. Mr. Ball, in his chapter on the wings and legs of ducks and fowls, appeals to this law constantly, and proves against Darwin that the reduced wings and thickened legs of domestic fowl are the result of artificial and natural selection, under circumstances most favorable to the production of such results. It must likewise be borne in mind that in estimating the supposed consequences of disuse in individual specimens there is danger always of mistaking the acquired results of disuse for the transmitted consequences thereof, and thus confounding atrophy with disuse-inheritance. This very important distinction should be constantly borne in mind, and it seems to me that both Spencer and Darwin frequently overlooked it. Perhaps one of the most interesting chapters in Mr. Ball's work is that which concerns the true relation of parents and offspring. It is almost a popular belief that the physical, moral and intellectual peculiarities of progenitors are directly transmitted to those who spring from them, so that the saying, "as the parent is, so is the child," has almost passed into an aphorism. But the truth is a parent transmits not himself and his modifications, but the stock, the type, the representative elements of the species to which he belongs. Should a flaw exhibit itself in an individual, it is quite possible to find it reproduced in the offspring; but any general resemblance, as a result of acquired peculiarities in the parent, does not exist. Indeed, on the contrary, it does occur, and Galton has verified the fact that acquired excellences are often followed by corresponding defects in subsequent generations. The explanation of this interesting peculiarity of heredity is found in the fact that when the nervous system is developed by prolonged exercise, and there is a consequent improvement in the individual faculties, the best and most highly developed cells are used in the process, and the inferior ones are employed in reproduction. "Hence," says Mr. Galton, "the strong tendency to deterioration in the transmission of every exceptionally gifted race."

But our author goes further than to deny the existence of use-inheritance; he even points out that if it did exist it would work for decided harm. Thus those organs which in the human family are most constantly in use, would go on taking increase of growth from generation to generation till they would become unshapely and unwieldy. The heart, for instance, which is never at rest, would become unduly hypertrophied, and the molar teeth lengthened by extra use would not permit the incisors to meet. Here, again, it is well to bear in mind that the so-called effects of use and disuse are frequently the result of natural selection and the law of the survival of the fittest, for organisms become through use adapted to their surroundings, and we are prone to assign to the former what are the clear results of the operation of the latter. Lamarck, who gave so much prominence to the influence of use and disuse, in the theory with which his name is identified,

did not understand the law of natural selection as conceived by Darwin, so that we may not wonder at the errors into which he fell; but it is hard to understand how the philosopher of modern evolution should strive to perpetuate such mistakes. Mr. Ball's work is a timely and ingenious contribution to scientific progress, and will be read with interest even by those who may not accept his arguments or agree with his conclusions.

C. M. O'L.

THE PHYSICIAN'S VISITING LIST FOR 1890, 10th year of its publication.
Philadelphia: P. Blakiston, Son & Co.

The Physician's Visiting List of P. Blakiston Son & Co. is one of the most convenient and valuable pocket books which the practitioner can have. Its tables of almanac, poison and antidotes, weights and measures, dose table, list of new remedies, page on disinfectants, examination of urine, methods for assisting respiration, etc., are as accurate and convenient as condensed space allows them to be. The list of patients for daily visits, memoranda, engagements and cash account are nicely divided to answer all ordinary purposes. While it is a physician's note book, it is one of the best adapted for veterinary practitioners,

BOOKS AND PAMPHLETS RECEIVED.

Antigüedades de Costa Rica por el Dr. H. Polakowsky, Anales del Museo Nacional. San Jose, 1890.

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KOCH'S METHOD WITH TUBERCULOSIS AND THE
EARLIER USE OF CORRESPONDING PRODUCTS IN
OTHER CONTAGIOUS DISEASES, READ BEFORE
THE NEW YORK STATE VETERINARY MEDICAL
ASSOCIATION.

BY JAMES LAW, F. R. C. S., CORNELL UNIVERSITY, ITHACA, N. Y.

Koch has at last made known the source of his "lymph." It may be called a solution, in a mixture of equal parts of water and glycerine, of the products of the culture of bacillus tuberculosis, or of the growth of tubercle. Stated more distinctly still, it is the poisonous chemical products of the growth of bacillus tuberculosis, or a part of such products. The fact that it is insoluble in alcohol suggests that it is more probably a ptomaine or organic alkaloid of fermentation, than a toxalbumin. To many doubtless the revelation will hardly be a surprise. The operation of the poison alike on the active local tubercle and on the tuberculous systems suggested as a factor the poisons normally acting in tuberculosis, and the analysis by the Parisian chemists greatly strengthened this suspicion.

Now, however, that surmise is changed to certainty, and that the active agent in Koch's lymph is known to be the chemical poison or poisons produced by the bacillus in its vital process, the question at once arises, have these products ever before been used in medicine? To this the answer is emphatically yes. The evidence of this I shall give below. Meanwhile let me say that nature herself displays the process in the great class of germ diseases in which the microbe—the living parasitic cause of the disease—does not live in the blood, but confines its attack to one circumscribed area, yet confers an immunity from the attacks of

that disease upon the entire system. As instances of this may be adduced cowpox and lung plague and mild cases of local anthrax. All the modes of conferring immunity by inoculating weakened or partially devitalized virus, or single germs of the more potent virus, or small doses of virus into the blood are in the main methods of availing of the same principle. The weakened germ and the single germ alike perish in the seat of inoculation by reason of their inability to struggle successfully with the more numerous and more potent tissue nuclei and the migrating cells. The germs thrown into the circulating blood are in the case of certain diseases like lung plague, similarly overcome and devoured by the myriads and myriads of actively moving blood globules, and thus fail to plant colonies in the tissues and thereby start local disease. What then is it, which permeating every tissue and entering every cell and nucleus, confers upon the whole body a subsequent immunity from the attacks of the inoculated microbe? Manifestly the chemical prisons, the products of the microbe's life, to which these tissues and cells become habituated and insusceptible. Those who avail of these methods may not have recognized the full value of these chemical poisonous products in the absence of the living germs, hence they have not felt justified in leaving out the dangerous germ itself, yet their results are undoubtedly due to the soluble products which permeate every part of the system, and not directly to the germ which is confined to the narrow area of tissue where it was inoculated, or, in the other case, to the circulating blood into which it was thrown. More than this, as I hope to show later, the ptomaines and other poisons have been experimentally used as medicine—apart from the living germs—for at least eleven years past, so that the separation of these chemical poisons from their living bacteridian sources, and their employment in medicine is not a new thing, nor was the justly famous Koch the first to use them apart from the living microbes for this purpose.

The new departure now made by Koch is not, therefore, the separation of the ptomaines and tox-albumins from the living microbe for medical use. That had been already accomplished. It is rather the application of such separated chemical poisons to the cure of already existing disease. Koch's departure has been the introduction of these agents into the field of therapeutics—they had *already* been introduced into prophylactics. The only apparent exception to this is in the methods of Pasteur for the protection of the individual bitten by a rabid animal. But

this is no real exception, because, 1st., the Pasturean inoculations for rabies are not made with the chemical products alone, but with these plus the microbes at first of a low vitality and potency, and then day by day of a stronger and stronger quality. 2nd, the Pasturean inoculations for rabies are prophylactic, being intended to habituate the brain and other nerve centres to the action of the soluble chemical poisons, while the living microbe is still confined to the region of the bite, so that such nervous centres shall have acquired an insusceptibility before the living germ can reach them to a viable condition. The tardy progress of the microbe of rabies to the nerve centres is based on the fact that the blood is highly inimical to the line of this germ.

From the standpoint of this rôle of the ptomaines, &c., I propose to shortly canvass Koch's method and some of its precursors, and to inquire into a number of the successive steps through which the science of medicine has advanced to its present state in this line of prophylaxis, and it must now be added of treatment. With this in view it may be well to trace some of the leading landmarks in the gradual discovery of those poisonous products now known as enzymes and ptomaines. Strangely enough the belief in chemical poisonous products antedates by many years the recognition of living germs as the cause of disease. Poisoning by decomposing meat and fish had long been a familiar occurrence when early in the eighteenth century Haller experimented by injecting watery extracts of putrid material into the veins of animals, and found that death resulted. In 1820 Kerner, investigating the question of poisonous sausage, came to the conclusion that the toxic principle was a fatty acid combined with a volatile principle. Otturs pursued similar investigations, but it was only in 1856 that Panum positively demonstrated that the poison was a chemical poison which was soluble in water and capable of filtration from other and insoluble bodies. He found in the decomposed flesh of the dog a toxic product, soluble in water, insoluble in alcohol, non-volatile and indestructible by boiling. Of this chemical poison 0.012 of a gram proved nearly fatal to a small dog. Panum, however, went further and succeeded in isolating another chemical poison from the putrid meat which was easily separable from the first by the fact that it was soluble in alcohol. This alcoholic extract injected into a dog's jugular threw him into a deep sleep for twenty-four hours, after which he awoke in apparent health. To Panum, therefore, we owe the first recognition of two classes of products of bacteridian growth,

which act on the animal system as chemical poisons, and which have now come to be recognized as *ptomaines* (πτῶμα cadaver). which are basic or alkaloidal, and toxic albuminoids of a non-basic nature.

Following Pasteur came Weber, Hemmer, Schwenninger, Peace-Jones, Dupré, Zuco, Bergmann, Schmiedeberg and others, and the true basic or alkaloidal nature of the product which is precipitated by alcohol was established.

The poisonous properties of the chemical products were after a long exposure to heat, which must have killed any living germs, for a time antagonized by the theory of causation by living germs, and so late as 1879 such an accomplished observer as Dr. Lewis argues the absence of living germs in septicæmia on the ground that septicæmic poisoning can be produced by purely chemical products.

But the permanence of that theory was impossible. Chauveau, Bert and Toussaint showed in the case of Anthrax that the filtration of the virulent liquids through an unglazed earthenware filterer rendered the filtrate noninfecting, while the solids retained in the filterer preserved their full potency. They further demonstrated that an overdose of the filtrate was speedily fatal, killing the animal in twelve hours, while a dose of the solids left on the filter did not kill until after thirty hours. Here we had at once the prompt poisoning by an excessive dose of the chemical poison and the slower poisoning by the implanting of the anthrax germ, and the slow production and increase within the system of the same chemical poisons as the germ grew and multiplied. Koch had obtained similar results with putrid fluids inoculated on mice.

To those who had been following the course of experimentation the field was not clear for a further advance, and such further advance had indeed become inevitable. A multitude of facts and observations testified that it was to the chemical poisons we must look for the direct toxic agents, while the microbes acted mainly as the products of such deleterious chemical products. In many cases like cowpox the microbe might be confined to a circumscribed area of tissue, but the soluble chemical products pervaded the whole system and rendered every tissue immune from future attack. In some cases, indeed, as in cattle lung-plague, the blood had been proved to be fatal to the germ, which thus remained confined to the part, lung or tail, where it had been implanted, but in case of survival no tissue in the body would thereafter furnish a favorable fluid for its inoculation and growth.

It was inevitable, then, that the next step should be taken—that of employing the devitalized chemical products of the microbe of a specific disease to render the system proof against such disease; and it was natural that Toussaint should be the first to enter the field. Devoted as he was to the line of experiments at government expense, in a national school of veterinary medicine, he had satisfied himself that the survivors of an attack of anthrax did not contract a second attack when exposed or inoculated. He therefore, in 1880, instituted experiments on sheep by heating the virulent anthrax fluids to 55° C. for from ten to fifteen minutes, and with this product inoculating the animals to be protected. In a short time he had ten animals thus inoculated that resisted all ordinary inoculations with anthrax virus. Then a crucial experiment was instituted at Alfort, in which twenty sheep were inoculated with his heated anthrax liquids, and unfortunately four of the number died of anthrax. Sixteen survived, and thereafter proved insusceptible to anthrax. The partially unfortunate result and Toussaint's increasing ill-health would appear to have deterred him from further advance in the same line, and no other European observer seemed then to appreciate the value of his results.

Experiments were, however, being made in the same direction in America. Dr. Salmon was in 1880 experimenting on fowl cholera, and I was dealing with swine plague, both for the National Department of Agriculture. Each independently of the other undertook to test the protective action of the ptomaines. Dr. Salmon's observations on the chicken disease led to negative results, the ptomaines being either volatile or destructible by heat. In my experiments with swine plague I was more fortunate. But to show my views at that date and the results I obtained, I shall quote from the Department of Agriculture Report on Contagious Diseases of Animals, 1880-1, pp. 135-146:

"Bacteria Intoxication and Bacteria Infection."

"In all diseases caused by microphytes there are two associated but distinct deleterious agents to be taken into account. 1st., the organism which is introduced from without, and multiplies in the body of the patient; 2nd., the chemical products elaborated by the growth and increase of the imported organism at the expense of the vital liquids. The two have been aptly named bacteria infection and bacteria intoxication. Each may be injurious and soon fatal, yet each has its special mode of action and its limitations, so that we can estimate with a

"reasonable amount of certainty the probable results in the two cases.

"In *bacteria infection* the self-multiplying organism is introduced into the body, and if it finds a suitable field for its growth it undergoes an indefinite increase, and may undermine the health or destroy life in one of various ways; for example by accumulating in the capillaries, arresting the flow of blood and abolishing the functions of vital organs, or leading to local abscess or gangrene; by obstructing oxygen and other essential elements from the blood, and resolving this vital fluid into a poisonous in place of a life-giving stream; or by reproducing itself into myraids, elaborating a vast amount of noxious chemical products and killing by poisoning. The *bacteria intoxication* or *poisoning*, on the other hand, is effected directly by the products of the growth of the bacteria, or in other words, by a chemical compound incapable in itself of reproducing or increasing its substance. The respective powers and limitations of the two poisons may thus be mapped out with great clearness."

"It is manifest that from *bacteria infection* may be derived all the evil results of *bacteria intoxication*, in addition to certain pernicious actions peculiarly its own. The germ being a living organism, with limitless powers of growth, it is manifest that apart from the power of the system to support it, there can be no bound to the amount of chemical poisonous product it may generate, and thus do its own special work of destruction of the essential constituents of the blood, deoxidation of the vital fluid, plugging of vessels, local abscess and gangrene, it must ever add the poisonous influences of its purely chemical products. But it has its limitations as well which do not belong to its products. In several bacteridian diseases the system will not sustain nor nourish the bacteria with the same readiness a second time, if at all. The system that has once sustained an attack does not readily succumb to the same again. An incompatibility or antagonism has been established between the system thus protected and the bacterian, and henceforth the system may be repeatedly inoculated with the bacterian with the most perfect impunity. This cannot be said of the chemical products of the bacteria growth. These, like all chemical poisons, will act again and again upon the same system with little difference in effect and, if a partial tolerance is acquired it can only be to a limited extent and after long exposure to their action, as tipplers acquire a tolerance of alcohol, or opium or arsenic eaters of these respective

"poisons. Kill the microphytes with the injecting bacteria liquids and the chemical products will act in exact ratio with the dose administered, and no amount of experience with the poison will prevent an excessive dose proving fatal. The action moreover will be prompt, and if it does not produce fatal results at an early stage, it will gradually subside, for since the poison cannot multiply itself its effects must steadily decrease with its elimination from the system. With *bacteria infection* on the other hand the evil effects must be somewhat delayed to allow of the reproduction of the germ and the production of the chemical poison, and thus the disorder of the system will undergo a progressive development. In another respect we may conceive of *bacteria infection* being limited in its evil results. If the bacteria increase slowly, the system will be likely to become somewhat habituated to the influence of the poison and insusceptible to it, so that by the time the disease reaches its height the system may be able to bear with impunity a quantity of the poison which it could not have tolerated had the same amount been introduced suddenly and before the economy had become inured to its influence."

"In illustration of the separate action of the bacteria and their products Koch's experiments on mice with putrid fluids are most instructive. * * * Koch injected putrid liquids under the skin of the mouse, and found, when the amount used had been excessive, that the mouse died in a few hours from the effects of the chemical poison, and that not a bacillus could be found in the blood within the vessels. If, on the other hand a minimum amount of the putrid liquid was used, as by making a slight scratch with a lancet, the tip of which had been dipped in the liquid, and if the mouse survived the primary danger of death by the chemical poison it died in the course of about two days of bacteria infection and the blood was found swarming with bacteria. Similarly Chauveau found that Algerian sheep, that are naturally insusceptible to *anthrax* and which had successfully resisted inoculation with a minimum amount of the virus, fell victims to the disease if an excess of the poison were injected under the skin, or if a second and third inoculation were practised before the effects of the first had passed off. Finally Cossar-Ewart, and Burdon-Sanderson found that when anthrax liquids had been devitalized by exposure for some time to compressed oxygen (12 atmosphere's) and when the germs had lost their power of propagation and increase, the fluid still proved injurious, and even fatal to animals on which it was inoculated. With the

"vital germ destroyed these evil effects could only come of the
"remaining chemical poisonous products, which retained their
"original potency."

"My own experiments with the virus of hog-cholera tend to
"establish the same fact in that disease. When I had subjected
"the virulent fluids for an hour to a temperature oscillating be-
"ween 130° and 140° F., and then inoculated them on the pig, I
"found that the result was a certain amount of constitutional dis-
"order and ill health, which did not however, go on to a fatal
"issue. * * * Similarly when I injected into the system large
"quantities of the virulent fluids, I found that death took place
"almost without exception, even in animals that had resisted
"ordinary inoculations. Of this mortality we may find an ex-
"planation in the ebrile state of the system induced by the presence
"of the chemical poisons. * * * It is not the increase in the
"number of the bacteria alone, nor the access of fresh, and there-
"fore more potent, germs, that have the evil effects, for in the in-
"fected system there is practically no limit to the multiplication
"of the bacteria, and these, in place of being weakened, are often
"rendered more potent by passing through a succession of animal
"systems. * * *"

*"Is future protection secured by the action of the chemical pro-
ducts alone, or is the presence in the system of the bacteria
essential?"*

Under this head are discussed the doctrines of immunity by elimination of systemic products necessary to feed the microbe ; by the deposition in the tissues of poisons inimical to the microbe, and of condensation of the lymph channels and glands, the first two being contradicted by the growth of the bacteria in the bouillon made from the flesh of an insusceptible animal, and their growth in a flask charged with their chemical products provided fresh meat-infusion is introduced. The third theory is disproved by the fact that different bacteridian diseases all alike resulting in such condensation of lymph channels are not mutually vicarious of each other. The doctrine of physiological resistance is shown to agree with all the facts and the immunity of the calf whose dam has passed through the bacteridian disease in the latter period of the gestation is especially dwelt on as evidence.

"This view is further strengthened by the fact that though
"an animal, that has acquired an immunity from a specific disease,
"afterward produces offspring which are susceptible to the disease
"we question, yet it has been shown in the case of anthrax, that

"if such immunity on the part of the parent has been acquired by
"a non-fatal attack of the affection during advanced pregnancy,
"preservative effect is extended to the foetus as well. Here the
"foetus has advanced beyond the condition of an ovum, or of simple
"embryonic cells or tissues and is already well formed, with all
"its differential bones, muscles, tendons, brain, nerves, vessels
"and viscera. The nuclei presiding over the growth of these
"different structures are henceforth fixed in their powers, and any
"habitude impressed upon them may now be permanently pre-
"served just as it is in the adult animal."

"This consideration serves to fortify the doctrine that the
"immunity from a contagious disease acquired by a first attack is
"due to a habit, or acquired power of endurance or resistance on
"the part of the living cells or nuclei of the animal body. This
"better accords with and explains observed facts, and is liable to
"fewer objections than any theory of the subject that has come
"under our notice. * * *"

"To return to our question, Do the observed facts accord best
"with the idea that protection is acquired by the action of the
"chemical products only of the bacteria, or is the presence in the
"system of the bacteria essential? As the question appears to
"us every thing serves to support the first conclusion. * * *
"The facts attending the acquired immunity of the advanced but
"unborn offspring of an anthrax mother seems to be almost con-
"clusive on this question. The blood of the dam (cow) may be
"swarming with bacteria, but these have never been found in the
"blood of the foetus. It is only reasonable to conclude that they
"have never entered the body of the foetus, or if otherwise, that
"they have perished very soon after they entered. The chemical
"products on the other hand, being soluble in the vital fluids pre-
"sumably enter the foetal system along with the natural secretions.
"The offspring when born proves refractory to the anthrax, so
"that there is the strongest presumption that it has been fortified
"by the action of the chemical products of the anthrax upon its
"system before birth. In this case immunity cannot well have
"resulted from any action of the growing and multiplying bacteria
"on the blood or living tissues, for the evidence is all opposed to
"the idea of their presence. at any time, in the foetal system, much
"more to their growth and propagation there. Yet here unques-
"tionally the disease in the mother has produced an insuscepti-
"bility in the foetus, such as would occur had it been itself the
"subject of the disease. It follows almost of necessity that the

"introduction into the system of the chemical products of the bacteria is equivalent in a protective sense to the introduction of the bacteria themselves. But the pure chemical products cannot undergo increase in the system ; therefore we can graduate the dose of these as safely as we can a dose of opium or rhubarb."

"With this presumptive evidence we are prepared to study the direct results of the introduction into the system of the chemical products of anthrax, and swineplague, made with a view of securing an insusceptibility to the respective diseases in the future."

Here follows record of Toussaint's experiments with anthrax which need not be repeated.

"My Results" With Swineplague.

"A pig was injected with one drachm of virulent swine-plague blood, which had been repeatedly heated to 130°, 150° and 200° F., and a month later with an equal amount of virulent blood which had been raised to 130° F., for thirty minutes, and the day following for three hours. This caused some loss of appetite and appearance of ill health, but no very appreciable fever. Thirteen days after the last operation this pig was placed in a small pen with a pig suffering from swineplague, and at intervals of a month was twice inoculated with the virus of swine-plague, but all without evil consequence."

"Another pig was injected with a drachm of the mucous-covered faeces of a pig suffering from swine plague, the infusion having first been filtered and heated for one-half an hour to 130° F. until all movement of the contained bacteria had ceased. As in the other case there was some evidence of ill health but no material fever, and on the thirty-eighth day the subject was placed in a small pen with a sick pig. Afterwards at intervals of a month ; it was twice innoculated with (swine plague) virus but successfully resisted, and maintained good general health."

"A third pig was injected with a drachm of pork infusion which had swarmed with bacteria resulting from an inoculation with infusion of putrid maize. Before inoculating it on the pig the pork infusion was heated to 140° F. for three hours in succession. There resulted some derangement of health, slight fever, and a local swelling in the seat of injection. When this had subsided, on the fourteenth day the pig was placed in a small pen in company with a diseased one. Nine days after she had a sharp attack of swine plague, which lasted eighteen

"days and led to much loss of condition. Later, at intervals of one month, she was twice inoculated with active virus of swine plague, but on each occasion without any further ill result."

"On the last occasion of the inoculation of these three pigs a fresh pig was inoculated with the same virulent matter, which caused considerable fever with a temperature varying from 104° to 106° F., but from which the subject finally recovered."

"Here, then, we have two pigs protected from the noxious action of the swine plague virus, by being first brought under the influence of the chemical products resulting from the growth of this virus in the system. We have, further, another pig treated in the same way with the products of an ordinary putrefactive fermentation in a pork infusion, which had been similarly devitalized by heat, but this fails to secure the same immunity, and this pig suffers surely from swine plague when made to cohabit with a victim of that disease. Later this pig and the two others successfully resist two successive inoculations with swine plague virus, while a fourth pig inoculated with this same virus sustains a considerable, but not a fatal attack."

"The experiments, it is true, are limited in number and liable to the objection that the results may have been accidental coincidences, yet so far as they go, they support the theory that the chemical product of the swine plague germ, when deprived of its living microphytes affects the system so as to render it, for the future, insusceptible to the attacks of such germs. When in connection with the fact that swine plague rarely recurs in the same individual, that, as in the case of other diseases that attack the same animal but once, the most rational explanation is that it is the deleterious products of the disease-germ, and not the germ itself that affects the system so as to secure this immunity, and finally considering that in the closely allied disease of anthrax Toussaint has secured a similar insusceptibility by an identical process, it is altogether reasonable to suppose that we are here furnished with a system of prevention which, if carried into general practice, would reduce our present losses from swine plague to a comparatively insignificant figure."

The report goes on to show the danger of popularizing this method since all the fatal diseases of hogs vulgarly, but mistakably known as hog cholera, would be resorted to for the protective ptomains with unsatisfactory results. Also that protection from all these varied fatal swine diseases would be vainly

sought by the use of the ptomains of swine plague. Then follow summaries of needful precautions, and of the manifest advantages and disadvantages of the method.

"PRECAUTIONS TO BE OBSERVED."

"1st. See that it is the genuine swine plague that is being dealt with. This is equally necessary as to the disease to be promoted and as to the virus which is to be devitalized for preventive inoculation."

"2d. The virulent fluid to be devitalized may be the blood of a diseased animal, or the liquid exudation into a diseased organ, including the lumen of the bowel. In such cases it is best taken at the height of the disease rather than from a partially convalescent animal in which the virus may have disappeared and the structural changes only may have benefit. If from a cultivation in pork infusion that should have been prepared with all due precaution against the introduction of air bacteria and with access to air, but which air should not much exceed one-fifth of its bulk."

"3d. In exposing this fluid to heat, that should be carried to 140° F. and retained at that temperature for an hour or more until, in short, all indication of life in the contained mycophytes have ceased."

"4th. Swine to be operated on must be kept apart from all diseased hogs and infected places and objects, for with the presence of the living germ in the system the injection of the devitalized chemical will only tend to aggravate the attack. For the same reason all inoculated animals showing symptoms of a severe attack and presumably suffering from bacteridian infection, in place of the single intoxication with the chemical products, should be at once removed from the herd operated on."

"5th. In inoculating the devitalized chemical products, the injection of a small quantity at a time, and its repetition at intervals of three days or a week promises to be safer and more effectual than one large injection. The injection of 10 to 20 drops at a time and its repetition once or twice, would probably secure a greater immunity with less loss of condition and progress than if a larger amount were introduced at once."

"6th. The animals operated on should be carefully guarded against infection for three weeks after the last injection of the devitalized virus. The presence of the chemical poison in the

“blood and the attendant constitutional disturbance invites rather than debars the growth of the plague-germ; how the latter must be excluded until the former has been entirely eliminated. For the same reason the free use of disinfectants in the operating yards and buildings will be of the utmost value. So will every conceivable precaution against the introduction of disease-germs through accidental channels as by other animals, by the pork stolen by dogs, as carried by men, &c.”

“ADVANTAGES PROMISED BY THIS METHOD.”

“1st. It offers immunity from a fatal disease by a method which does not entail the propagation of the living germ in the system of the animal, to be protected.”

“2d. It avoids the risk of the preservation, amplification, diffusion or increase of potency of the disease-germ, all of which contingencies are possible in inoculations with a mitigated virus.”

“3d. It does away with the necessity for an exhaustive disinfection after the animals have been inoculated and have recovered from its results.”

“4th. The dose of the devitalized chemical products can be so graduated to the strength of the animal that there will be no risk of a fatal result. When even the mitigated living germ is introduced there can no longer be any certainty that it will not reproduce itself to a dangerous extent, or that owing to the special condition of the system or of its surrounding it may not suddenly assume its fatal type; but with the devitalized chemical products we can graduate the dose so as to secure as great a certainty as in the case of a dose of castor oil or Epsom salts.”

“5th. The system can be habituated to the poison and fortified against it by a succession of small doses, no one of which is at all dangerous in itself, whereas if a living germ were once introduced, though of mitigated power, it may increase so as to develop a power that is altogether unexpected.”

“DISADVANTAGES AND DRAWBACKS.”

“These are few apart from the certainty that, if largely resorted to, it will be misapplied by many, to other diseases than the genuine swineplague, and will thus fall into disrepute.”

“It can do no good, but only harm to animals that are already injected, as it can only add to the detestable products with which the germ is charging the system.”

"Its effect can only be evil if the subjects are allowed to become infected before the chemical products have had time to fully affect the system, and to have become eliminated. If this is neglected, and early infection is allowed it can only add to the mortality."

"There is the additional disadvantage that to secure the protective products, the production of a virulent germ must be kept up, either in the bodies of a successive series of diseased pigs or in an infusion of pork. The slightest carelessness with regard to the seclusion of these fluids of poison, or as to the disposal of their products, may easily become the occasion of a spread of the worst type of the plague among unprotected animals."

I have quoted thus at length to show that at that date it was with me no mere chance suggestion but a settled conviction, based on my own successful experiments and the long series of experiments by others which had led up unmistakably to this conclusion. And this at a time when Koch, whose experiments on mice had directly indicated the principle availed of, had not yet apparently grasped the true significance of the plomaines in conferring immunity and when Toussaint, who was the first to apply the principle had been nonplused by the unlooked-for results of the Alfort experiment, and led to conclude that his former successes depended on a retained vitality in the virus employed.

In the Department of Agriculture Report for 1882 Dr. Salmon again records his lack of success with this method in chicken cholera, and while accepting the principle that immunity is naturally secured through a power of resistance acquired by the living tissues by continuous exposure to the action of the poisonous Ptomaines, he specifically denies the possibility of any benefit from the use of small doses from the latter. On page 310 of the Dept. Report he says: "That this method was entirely inefficient however, was completely demonstrated, and the conclusions of Toussaint and others shown to defend on wrong interpretations of the facts observed."

DR. SALMON'S SUCCESS WITH SWINEPLAGUE.

Dr. Salmon seems to have returned to his method in December 1885. In a paper read before the Biological Society of Washington, Feb. 20, 1886, and contributed by Drs. Salmon and Smith, these gentlemen record their experiments on six pigeons with swineplague virus sterilized by heat (58°C. for ten minutes). One pigeon No. 8, was injected with 0.8 cc. of the heated culture

fluid and 51 days latter it was inoculated with 0.75 cc. of strong swineplague virus with the result that it died in 48 hours. A second pigeon No. 10, was injected with 0.4 cc. of the heated virus, and on three subsequent occasions at intervals of 28, 8 and 8 days it had an inoculation of 1.5 cc. of similar heated virus, and on the seventh day succeeding the last injection it had an injection of 0.75 cc. of strong virus, but remained well. Two other pigeons had injections of 1.5 cc. of the heated virus on three occasions with intervals of eight days and a third had two injections of the same amount with an interval of sixteen days, and seven days after the last each was injected with 0.75 cc. of strong virus but all remained in good health. Finally a chick pigeon which had not been injected with the heated virus was the same day with the five others injected with the same amount (0.75 cc.) of strong virus and died in 24 hours. They thus sum their conclusions :—

“1st. Immunity is the result of the exposure of the bioplasm “of the animal body to the chemical products of the growth of the “specific microbes which constitute the virus of contagious “fevers.”

“2d. These particular chemical products are produced by the “growth of the microbes in suitable culture fluids in the labora- “tory as well as in the liquids and tissues of the body.”

“3d. Immunity may be produced by introducing into the “animal body such chemical products that have been produced “in the laboratory.”

This paper has been generally accepted as crediting its authors with the discovery of this principle of immunity by chemical products of the life of the germ, a principle which I set forth so extensively in its bearing on the same disease five years before. It is true that I did not experiment with sterilized laboratory cultures, but assumed as self-evident that the disease germs grown in a suitable medium and with a limited supply of air would elaborate the same poisonous products.

EXPERIMENTS ON PIGS BY DRS. SALMON AND SMITH.

In the Report on Hog Cholera issued by the Bureau of Animal Industry in 1889, Drs. Salmon and Smith record the result of injections with sterilized virus on twenty-two pigs, which, at first sight is anything but reassuring as to the value of such products in protecting these animals against the disease. Of the whole number treated with the sterilized virus twenty died

and only two resisted the disease when subsequently exposed. The following gives the results in tabular form :

Experiment.	Number of Animals.	Times inoc'd with Sterilized Virus.	Intervals between such Inoculations.	Total Sterilized Virus used for each Pig.	Exposure to Infection after last Inoculation with Sterilized Virus.	Mode of Exposure.	Died.	Did not Sick-en.	Interval Exposure to Death.
			Days.		Days.				Days.
1st	2	2	8	18cc.	10	Fed Diseased Intestines of Pig put in Infected Pen.	2		10-17
2d	{ 3	2	3	19cc.	15	Put in Infected Pen.	3		31, 98, 113
	{ 2	0	0	0			2		14, 19
	{ 2	2	5	20cc.	22	"	2		29, 83
3d	{ 1	2	5	20cc.	57	"	1		34
	{ 2	2	5	20cc.	22	"		2	
	{ 2	4	2,2,2	33.5cc.	8	"	2		15, 19
4th	{ 2	3	2,2	25.5cc.	10	"	2		13, 15
	{ 2	2	2	18cc.	8	"	2		13, 15
	{ 3	0	0	0		"	3		13, 19, 39
	{ 5	2	3	40cc.	4	"	5		15, 16, 18
5th	{ 1	2	3	33cc.	4	"	1		19, 19
	{ 1	0	0	0		"	1		18
							1		18

There are some points to be noted in explanation of the terrible mortality :

1st. The excess of the sterilized virus used, from 18 cc. in two doses in eight days to 40cc. in two doses in three days. Because a pig suffering from hog cholera has a great excess of these poisons in its system it does not follow that that amount is essential to secure immunity. The single vaccine vesicle protects the average system. Further, in a disease which, like hog cholera, produces congestion and even necrotic ulceration of such vital organs as the intestines and mesenteric lymphatic glands, the ptomains are likely to endanger lesions of these parts that may prove lasting, and the embryonic tissue in such lesions would be especially open to colonization by the microbe. We see an example of this in the predisposition to tuberculosis where there is any inflammation of the air passage. It is notorious that after passing through hog-cholera a pig rarely thrives. It is desirable therefore to use small doses only of this chemical poison for the pig and to avoid if possible the production of lesions which would virtually predispose to the disease.

2d. In the more fatal cases the exposure to infection was made so early as to forbid the idea that the system had had time

to have completely rid itself of the poisonous chemical products, and much less to have risen over their profoundly depressing effects. The intervals of four, eight and ten days respectively between the injection of large doses of the chemical poisons and exposure to infection suggests the presence of that toxic effect of the ptomaines which lays the system open to the microphytes. One hardly wonders that these subjects died in periods varying from thirteen to nineteen days thereafter. It is noticeable that the two pigs that escaped the infection, and the six that survived 29, 31, 34, 83, 98, and 113 days respectively, were those that had at once had a small amount of the sterilized virus 19 cc. and 20 cc. and that had exposure to infection delayed longer (15, 22 and 57 days) after such injections had been made. It may be that immunity by this means is not safely attainable on a large scale, yet even this dreadful table bears testimony to the operation of the principle of protection by chemical products of the germ, however unfavorable the conditions. The energy of the disease was abated and the acute disease was exchanged for the sub-acute and chronic form in all cases in which the sterilized lymph was moderate in amount and the subsequent exposure to infection delayed.

3d. It is to be noted that in the case of these experimental pigs the test was an unusually severe one. The ingestion of the diseased bowels ten days after the pigs had been injected with the prostrating ptomaines, and followed by exposure in an infected pen was a test of extraordinary severity. Again in the other cases the reporters say that the infection in the pens was unusually intense, the experimental pigs being constantly surrounded by the sick and dying, at one time fifteen pigs dying in three weeks, and at another "pigs died almost every day" in the infected pen.

Taken all in all these experiments sustain the doctrine of protection by the ptomaines although they do not show a large percentage of survivors.

EXPERIMENTS WITH LUNG-PLAGUE OF CATTLE.

Inoculations With Sequestrum.

My next essay in this field was with lung-plague, and my first experiments were made by diluting and inoculating the juice squeezed from a sequestrum from the lung of a cow which had been attacked at Orange, N. J., August 27, 1881. The cow was killed January 3d, 1882, and January 5th inoculated three yearlings by injecting forty drops into each lung of each animal using a

hypodermic syringe with long nozzle, which was passed through the intercostal spaces. Two of the yearlings coughed a few times but all of them at once took to eating heartily. One, which may be called No. 1, was suffering from a chronic bronchial catarrh, and one gram of the sequestrum was inserted into a subcutaneous pouch in front of its shoulder. At the time of inoculation all had a temperature of 103° F. For two days there was a very circumscribed crepitation in the seat of the inoculation, before the third or fourth day this had disappeared in all alike. The temperature of No. 1 remained at 103° F., that of Nos. 2 and 3 went down to 102° F.

All remained without further change for six weeks and on Feb. 16, I again inoculated each in the right lung with forty drops of the slightly diluted juice of a sequestrum taken Feb. 15, from a New York City cow by Dr. James D. Hopkins. This cow had been sick eleven weeks before her slaughter. Seventeen days later I found the temperature of 2 and 3 had risen to 103.5° F., and this it did occasionally for eight days but there was no other indication of illness.

March 16 I inoculated these three and another (No. 4.) in the right lung with the freshly exuded *lymph* from the lung of a cow which had sickened March 13, and was killed March 14. March 23, No. 4 coughed while temperature was being taken and this was repeated daily until the 26th when there was slight crepitus in the right lung. Temperature 103.75° F., pulse 60, breathing quiet. Temperature on the 25th had been 103.5° F. Next day her temperature was 102°, but on March 29th it was 103.5° and by April 1, and 2 had reached 105.75° F. There was slight dulness over most of the right lung and swelling of the right side of the chest. It ate and ruminated but was losing flesh. (Nos. 2 and 3 showed no reaction.)

Necropsy of Check Case No. 4.

This subject was killed April 22, and showed on necropsy the right side engorged from shoulder to flank with the usual straw-colored lung-plague exudate, the pale yellow muscles and bands of connective tissues being pushed apart so as to give the tissues a honeycombed appearance, excepting in the central part around the seat of inoculation where they were condensed and fibrous, like an organizing false membrane. The right plural sac contained a considerable liquid exudate and false membranes covered the lower portion of the pleura and pericardium. The lung was

normal, the inoculating nozzle having manifestly failed to enter it. The subdorsal lymphatic glands were enlarged, gorged with blood, and showed a granular appearance.

Necropsy No. 1.

On April 13, I had already made a necropsy of No. 1, but found only the lesions of the original bronchial catarrh and two small curdy-looking masses—manifestly tubercle—in front of the left leaflet of the diaphragm and in the spleen respectively.

Inoculations with Sterilized Exudate from Recent Lung-plague.

March 22, I inoculated two yearlings (Nos. 5 and 6) in the tail with a drachm each of the exudate taken from the lung of a recent case of lung-plague, and heated for some time to 180° F. There ensued a slight swelling in each in the seat of inoculation but no general reaction. Thirteen days later (April 4,) these were tied, one on each side of the sick check case, No. 4, and kept there until the latter was slaughtered, April 22. April 9 to 10, the temperature of both rose to 103°, 104° and in the case of No. 5, on the 14th and 15th to 105° and 106° then subsided to the normal (102°). There was no indication of any lung disease.

April 21, I inoculated a yearling heifer, No. 7, in the tail and left flank with the sterilized lymph from the flank of No. 4, killed same day. This lymph had been kept for hours at 140° to 150° F. There was no local nor general reaction.

April 27, inoculated No. 7 and another yearling, No. 8, with sterilized lymph that had been heated to 140° for several hours. There was no reaction.

April 22, I inoculated a yearling in the left lung and in the trachea with fresh lymph from No. 4, just killed. In all 1½ oz., of the liquid was employed. From April 24, to 30, the temperature ranged in the main 104° F. and 105° F. and thereafter to May 20, oscillated between 104° F. and the normal. Swellings appeared in the neck and left side in the seats of inoculation, pulse and breathing ranged high but no distinct lung symptoms were observed. The local swellings subsided to two hard masses like hickory nuts and the general disorder disappeared. Later at the post mortem examination this animal showed a small sequestrum in the left lung and old false membranes on the pleura.

Exposure of the Above to Infection.

On July 15, I sent three of the survivors to Christopher Slade, Whitehall, Baltimore Co., Md., to be kept in his infected stables and three to Mr. W. W. Nabbs, Newtown, Queen's Co., L. I., to be placed with his infected herd in the close buildings of a town dairy. Three months later I heard from both gentlemen that not one of these cattle had shown a sign of lung plague.

Table Showing Lung plague in Inoculations.

No. of Subjects.	Inoculations.		Intervals between Inoculations.	Inoculations with Lymph of Acute Lung Plague.	Cohabited with Cases of Lung Plague.	Time from last Sterilized Injection to Exposure to Disease.	Result.
	With Old Sequestrum of Lung Plague	With Lymph of Acute Lung Plague Sterilized by Heat.					
	Times.	Times.	Days.	Times.	Months.	Days.	
2	2		42	1			Nil.
1	2		42	1		28	"
1				1			Lung Plague
2		1			18 Days.	18	Nil.
1		2	5		3 Months.	79	"
1		1			3 Months.	79	"
1				1			Lung Plague

FURTHER EXPERIMENTS WITH LUNG PLAGUE.

In August 1883, I inoculated with lung plague exudate sterilized by heat, a number of cows going into dairy stables in New York and Brooklyn. One went into an infected stable in 70th St., and 2nd Ave., New York, and two to McDonald's, Greenpoint, which was habitually infected. The dealer P. McCabe, assured me a year later, that none of these contracted lung-plague.

April 3, 1884, I inoculated with similar sterilized exudate, eight cows for J. Colman, five for Mr. Reilly, and nineteen for Mrs. Lynch all in 89th St., New York, seventeen for D. F. Murphy, 92d St., and two for Mrs. Barry, 95th St., and from the later reports of these parties I have reason to believe that all the cows operated on escaped the disease which habitually existed in the locality.

Twice I have had untoward results, in herds wherein the plague existed at the time. In one case the diseased lung used to furnish the lymph was an unsatisfactory specimen having little exudate into its substance and the disease continued to occur in the herd. In the second case the only lung available had through-

out advanced into a state of firm dry-granular hepatization and had a mawkish heavy odor, and no thermometer could be found marking above 120° F. As a result the heat employed failed to sterilize, and the tails swelled as under an inoculation with the unaltered virus. The result was protective, but many lost their tails, and one Jersey died in a herd of fifty head. Most of these cases were reported to the Fourth International Veterinary Congress, at Brussels, in September 1883. (See *Comptes Rendus* of this Congress, pp. 496 to 501.)

EXPERIMENTS WITH ANTHRAX.

Mr. Shepherd, Skaneateles, N. Y., had nineteen head of cattle attacked with Splenic Apoplexy, January 1883. In a few days he lost seven adult cattle and one calf, together with a mare and colt and one pig. Eleven cattle recovered. In March 1884, he lost one heifer, in May three young calves, in June one mare, July 3, one horse and July 6, one yearling colt. The cattle first attacked grazed in a pasture in which was a swamp and where there had formerly been a slaughter house. The horses in 1884 were kept in an orchard into which drained the yard used by the infected cattle in 1883.

July 8, I visited the herd obtained the requisite blood from a victim of the disease, heated it for an hour to 150° F., and injected twelve cattle with one drachm each of the sterilized product. One heifer remained, and by desire of the owner this was left as a test case. Within two days this thirteenth animal died of anthrax and the other twelve survived without illness.

In 1885 I operated in the same way on a large herd of cattle in Columbia Co., N. Y., among which anthrax had appeared. This herd escaped without a single loss.

From the early eruption of symptoms and the rapid progress of anthrax it is especially favorable to such treatment in infected herds. The truly sick can easily be picked out, and the inoculation of the others is likely to prove protective. The shortness of the incubation, and above all the absence of occult and chronic forms of the disease saves the operator largely from the dangers that beset him in such affections as lung-plague and hog cholera.

EXPERIMENTS WITH RABIES.

1st. April 2, 1886, I injected hypodermically in the back of a rabbit (No. 1) ten drops of a lactescent fluid made with the brain of

a mad dog who had died of hydrophobia March 30. May 18, the same rabbit was again injected hypodermically with brain matter of a dog which died May 17 of rabies. January 14, (seventy-two days after the first inoculation) this rabbit was found paralyzed, the paralysis increasing the two following days, so it was killed June 16, and utilized for further inoculations.

2d. April 3, I injected on the left cerebral hemisphere of rabbit No. 2 the same fluid (from the human brain) used on No. 1. Rabbit was dull for three days, but ate its food. After this it was well and lively up to the 18th inclusive. April 19, in the morning it was paralytic but still fed. April 21, the paralysis had become complete, and body was becoming cold. At 4 P. M. it was found dead. The attack came on the 16th day after inoculation, the regulation time for rabies resulting from inoculation on the brain.

3d. April 3, I injected a black and tan terrier No. 3, in the flank with twenty drops of the same liquid used for Nos. 1 and 2, but which had been first heated for an hour to a temperature ranging from 150° to 180° F. April 19 and 20, two other inoculations were made in the flank with the same sterilized liquid as before. April 22, an inoculation was made on the cerebrum of a milky fluid made by mixing with boiled water a portion of the medulla oblongata of rabbit No. 2, which died the day before.

May 17, the dog which had lost appetite somewhat for several days snapped at a stick and later at my leg. It was found dead next morning. It is noticeable that twenty-five days elapsed before symptoms appeared. The rule is that after inoculation on the brain symptom set in in sixteen days; it is therefore reasonable to infer that the first inoculation with sterilized virus had conferred a partial insusceptibility.

4th. April 22, I inoculated in the back hypodermically a rabbit, No. 4, with twenty drops of the mixture of the medulla of rabbit No. 2, diluted with boiled water. May 18, the same rabbit was again inoculated with brain matter of the dog No. 3. This rabbit was found dead November 29.

5th. April 22, I added three grains of medulla No. 2 to six drachms water and heated for an hour to 150° to 170° F., leaving the vessel wrapped in a rug so that it remained warm till the morning. April 23, heated the mixture till it began to simmer, superheated the neck of the flask, and injected one drachm hypodermically in the back of rabbit No. 5. May 18, inoculated this rabbit in the back with brain matter of dog No. 3. February

24, 1887, injected on the left cerebral hemisphere ten drops of a mixture of a healthy rat's brain and boiled water. April 15, this rabbit was in good health when I had to leave home for Chicago.

In view of the claim that healthy brain matter inoculated on the cerebrum would kill in sixteen days by paralysis, on February 24, 1887, I inoculated the brains of three additional rabbits with matter from the brain of a rat just killed, but all remained well when I was called by the United States Government to go to Chicago April 15.

We have thus traced some landmarks of the incipency and development of the doctrine of immunity by the use of the purely chemical products of the plague-germ. We have seen the principle applied in practice to *anthrax* by *Toussaint* in 1880. We have seen it applied to *swineplague* by *Law* almost at the same date, and published in the Agricultural Report for 1880. We have seen it applied to *lungplague* by *Law* in 1882 and recorded in the report of the International Veterinary Congress of 1883. We have seen it again applied to *Anthrax* by *Law* in 1883. We have seen it applied to *Swineplague in pigeons* by *Salmon and Smith* in 1886 and set forth in their paper presented to the Biological Society February 20, 1886, "On a New Method of Producing Immunity from Contagious Diseases." Finally we have seen the experiments on *Rabies* by *Law* in 1886.

Contrary therefore to the impression that *Salmon and Smith* inaugurated this method, the first successful step had been taken six years before by *Toussaint*, and the indisputable printed records show that I had a gratifying measure of success with three plagues five, four and three years respectively before the successful experiments of *Salmon and Smith* on which they based their "New Method." I say this in no disparaging spirit, as no one is more ready than I to acknowledge the great work that Drs. *Salmon and Smith* are accomplishing for the country. They can well afford to allow the justice of my claim of priority in this matter.

OBSCURITIES AND DIFFICULTIES IN KOCH'S METHOD.

While the basis of Koch's fluid is the chemical products of the bacillus tuberculosis the use to which he puts it of a curative rather than a prophylactic agent introduces an element of difficulty. The tendency of tuberculosis is to death of the tubercle. The chemical poisons may therefore be looked upon as necrosing ptomaines. It would seem therefore as if its sole benefit must result from the expediting of this process. In a lupus or other

superficial tuberculous product this may prove curative, but in the case of a tubercle imbedded in the depth of a solid organ, it puzzles one to see how the dead mass is to be eliminated and a recovery secured without a general diffusion of the contained bacilli. Koch himself allows that the bacilli are not all killed. And now Virchow on the strength of twenty-one post mortem examinations of individuals treated by Koch's method asserts that it endangers the diffusion of the germ and the onset of a general tuberculosis. It now appears that even some cases of lupus are refractory.

Similarly it would seem as if the method would entail great risk in case of tuberculosis of the bowel. Here the resulting necrosis must endanger perforation of the intestine and septic peritonitis.

But again tuberculosis can hardly be classed among non-recurring diseases. Though its subject acquires in him a partial tolerance of the poison, yet this does not forbid a continuance of the tuberculous process for a long lifetime in man and beast alike. A temporarily dormant state of the disease does not hinder its breaking out anew in an acute and generalized form under unwholesome conditions of life. How often do we see one or two old calcified tubercles, in a system the subject of acute tuberculosis. *Prima facie*, therefore, it would seem as if tuberculosis did not belong to that class of diseases for which a personal immunity of a reliable kind could be acquired. But if so, is not the benefit from Koch's method to be limited in the main to the process of local necrosis of superficial tubercle, and of such deeper formations as can be safely reached and removed by surgical means? It seems that the great bacteriologist himself is aware of this and is calling in the aid of Bergmann for the subsequent resection of the diseased joints. If the bacillus escapes from the inclosed tubercle into the adjacent living tissue the vitality and antagonism of which is reduced by contact with the ptomaines there is everything to favor formation of a new colony.

Even the alleged value of the injection as a means of diagnosis is now falling into doubt. The fibrile reaction sometimes occurs in the non-tuberculous, and some unquestionably tuberculous subjects do not show it. Koch justly claims a diagnostic value for the local reaction only. This may be itself incapable of diagnosis in internal tubercle.

On the whole there seems to be good reason for moderating very materially the extravagant expectations with which Koch's tuberculosis treatment was heralded. Much of the unreasonable

claims made for him was doubtless due to the high reputation of the author of the method, and his known habits of carefulness and thoroughness, but in this case his perhaps too precipitate launching of the fact of his discovery, and the mystery with which he surrounded its real nature fostered hopes and generated surmises, which he himself did not literally claim, and which have been to a greater or less extent doomed to disappointment. That Koch has inaugurated a method of great value for a limited number of cases of tuberculosis (the superficial, the incipient and those that can be supplimented by surgical measures) is undoubted, but for another class of these cases its value seems to me extremely apocryphal, and to expect from it an acquired and permanent immunity would seem to contradict the nature of the disease.

REPORT OF THE COMMITTEE ON ANIMAL DISEASES AND ANIMAL FOODS.

AMERICAN PUBLIC HEALTH ASSOCIATION.

D. E. Salmon, Chairman.

Your Committee in presenting its final report desires to call attention to the rapid progress of the last few years in elucidating the nature of the more serious diseases of animals and in preventing their ravages. Within seven years the bacilli which cause the two most common diseases of swine have been discovered and carefully studied. The protozoa which apparently cause Texas fever have also been demonstrated, as well as the fact that their development in the animal body is in some way connected with the ticks that are transported by cattle from the infected district. These discoveries clear up many of the mysterious characters which for a long time excited the astonishment and frequently the sceptism of scientific men in regard to the clinical observations that were from time to time made public.

Then we have seen the successful results of a still more advanced line of researches, *i. e.*, the study of the chemical products which accompany bacterial multiplication, their application for the production immunity, and even, in one case, the making by synthetical combinations in the laboratory of a compound which grants immunity. This at present appears to be the ideal achievement—the *ne plus ultra* of what we can hope for in the treatment of the animal body to produce immunity from disease.

It is a line of investigation which will sooner or later be applied to all of the non-recurrent diseases it is destined to be of the greatest service.

Your Committee is also gratified at the rapid progress being made in the United States in the eradication and control of animal diseases. The contagious pleuro-pneumonia of cattle, which four years ago threatened to extend over the whole country has been repressed and eradicated by the efforts of the general government, and so thorough has been the work that but two herds have been affected by it during the last three months. It is now only a question of a few months when the contagion will be entirely eradicated from the American continent. Texas fever has also been so thoroughly controlled that but few cases have occurred during 1890 in the country, the marked decrease being indicated by the summer insurance rates on export cattle which have on this account been reduced the present year about fifty per cent.

The infectious diseases of swine, tuberculosis of cattle and cholera of fowls are now the principal widespread and destructive plagues which carry on their ravages without control among the food producing animals of the United States. What action will be taken in regard to these by the national and State governments it is yet too early to predict, but it seems evident that the general demand for a more rigid and systematic inspection of meats will lead not only to the adoption of inspection, but will also eventually bring about general measures for the prevention of these diseases.

The subjects of animal diseases and animal foods are inseparably connected so far as the questions considered by your Committee are concerned. With the preventable diseases of meat-producing animals eradicated or controlled, and with a proper inspection at the time of slaughter, the animal food of this country would be beyond reproach or criticism. With a generally salubrious climate, with the finest pastures in the world, with that peculiarly American staple, maize, for feeding, in addition to the forage available in other countries, with a complete freedom from some of the worse plagues which affect the animals of the old world, with the most improved breeds which the world affords and with the most intelligent farmers found in any country, there is every reason why the meat of the United States should be superior to that produced elsewhere. Your Committee believe that the meat sold in this country has already attained to this condition of superiority, but they find that more thorough inspection and the repression of the animal plagues above mentioned

are nevertheless desirable, and of great importance as sanitary measures. With the wealth and civilization of the United States it is felt that we should lead the world in taking such precautions rather than to follow in the wake of the most advanced government.

Referring to its former reports for greater details, your Committee closes its labors with this general survey of the important questions which you have placed in its charge for examination and report. The members individually and collectively return their thanks for the honor which has been conferred upon them, and for the trust and confidence reposed in them by this Association. As a Committee it has been our endeavor to point out the dangers with which our people are threatened through their food supply, and the means of removing them, but at the same time it has been necessary for us to use such moderate and conservative language as would guard against undue alarm among the masses of our people consuming so important a part of their daily nourishment. If we have accomplished something towards the dissemination of more intelligent ideas in regard to the diseases of animals, and more definite views as to the necessity of pure food and the means of obtaining it, we shall consider ourselves fortunate and well repaid for our labors.

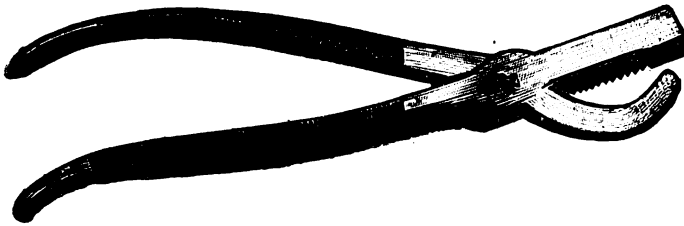
Respectfully submitted,

D. E. SALMON,

Chairman of Committee.

HAUSSMANN EMASCULATOR.

Messrs Hausmann, McComb & Dunn of Chicago have recently produced a castrating forceps which allows of rapid use, shown by the accompanying illustration.



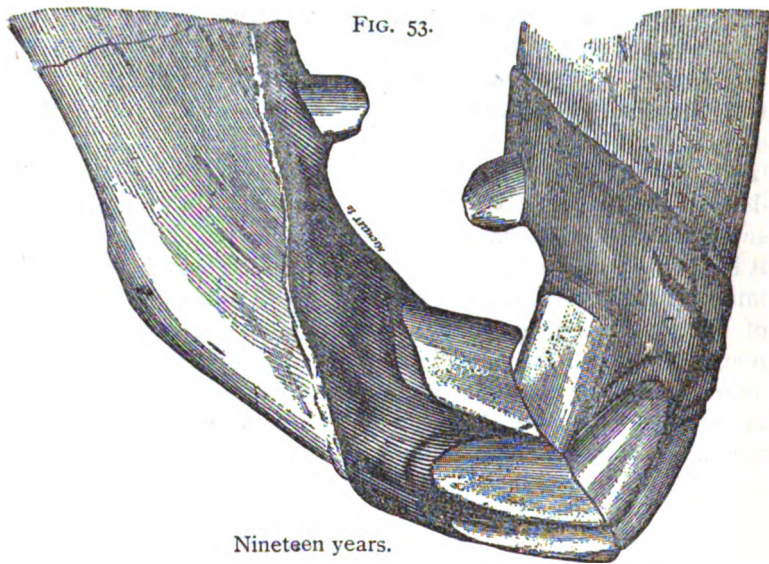
The lower blade is solid and passes through the upper blade which is fenestrated. One edge of the upper blade is rough and the other edge sharp; the roughened edge is slightly raised so that in closing the blades, the cord is engaged between the lower blade and the roughened edge of the upper blade, and crushed before reaching the cutting edge.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M. D., VETERINARIAN.

[Continued from page 29.]

FIG. 53.



Nineteen years.

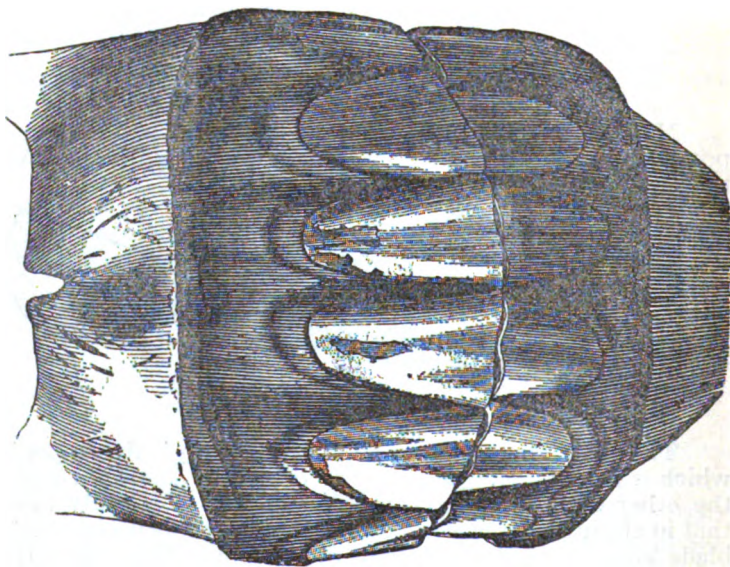
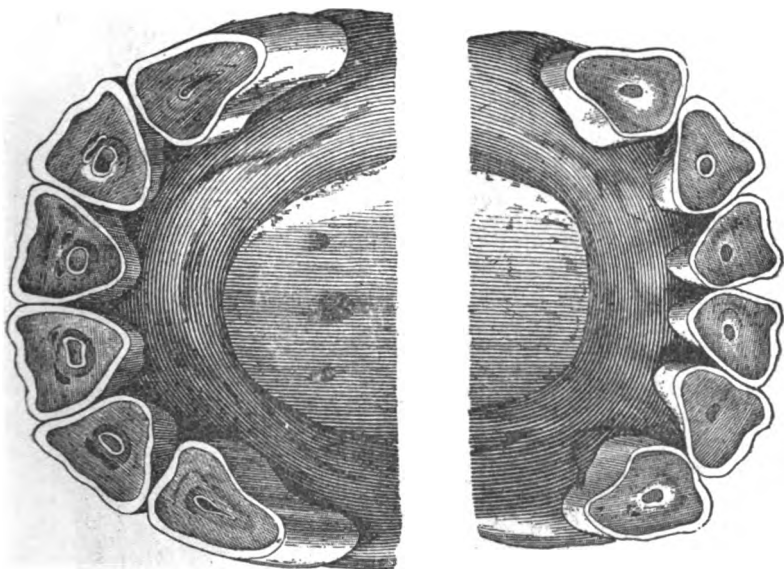


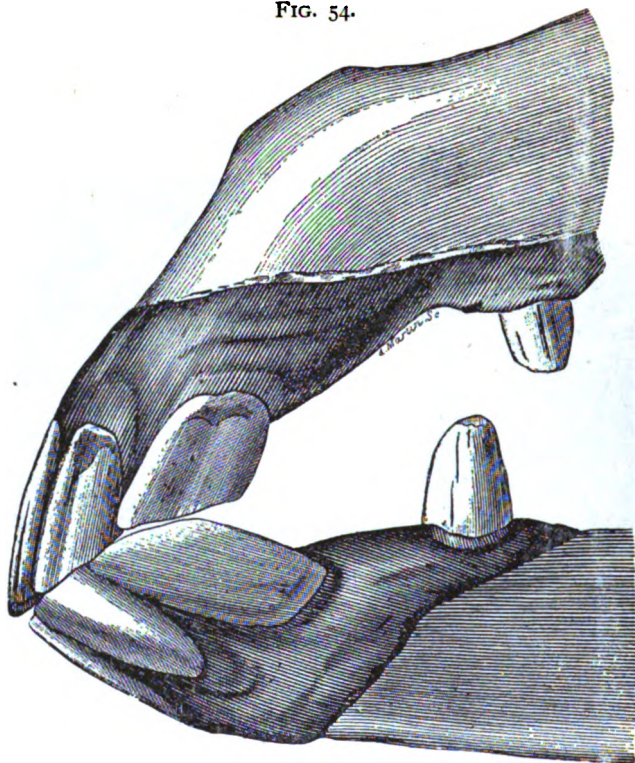
FIG. 53.



Nineteen Years.—FIG 53.

From in front the superior corner teeth point distinctly toward the median line, the intermediate teeth commence to incline in the same direction, showing a marked triangular space between them at the line of the gums. In Profile the ogive formed by the apposition of the jaws is more closed. The notch still remains in the superior corner teeth but is less marked in this age from the increased horizontal position of the inferior corner teeth. The tables of the pincers and the intermediate inferior teeth seem to converge at their posterior border on account of their diverging in front; their antero-posterior diameters have become greater. The inferior corners are always triangular in the upper jaw; the pincher teeth are usually leveled although the cup sometimes remains in them for several years more.

FIG. 54.



Twenty-one years.

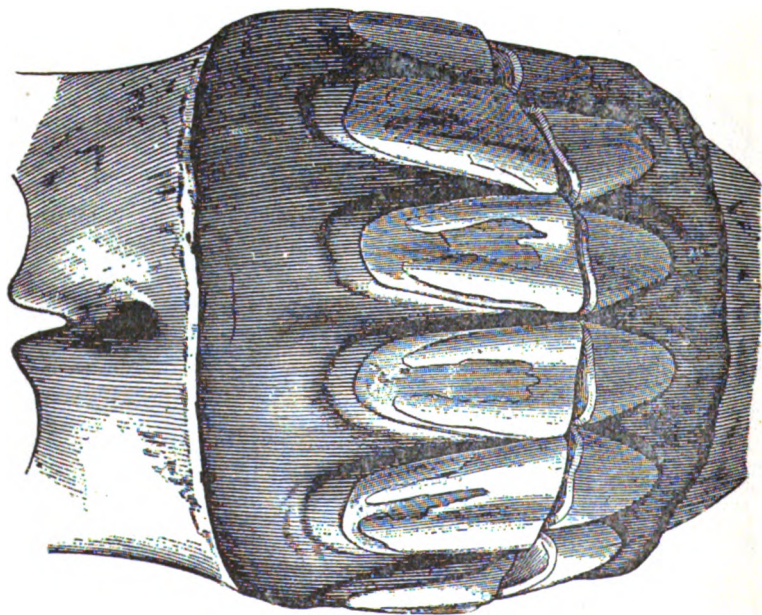
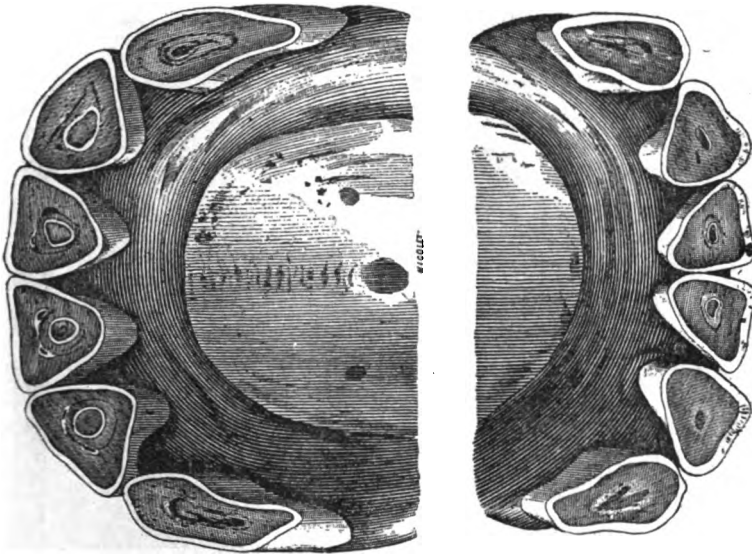


FIG. 54.

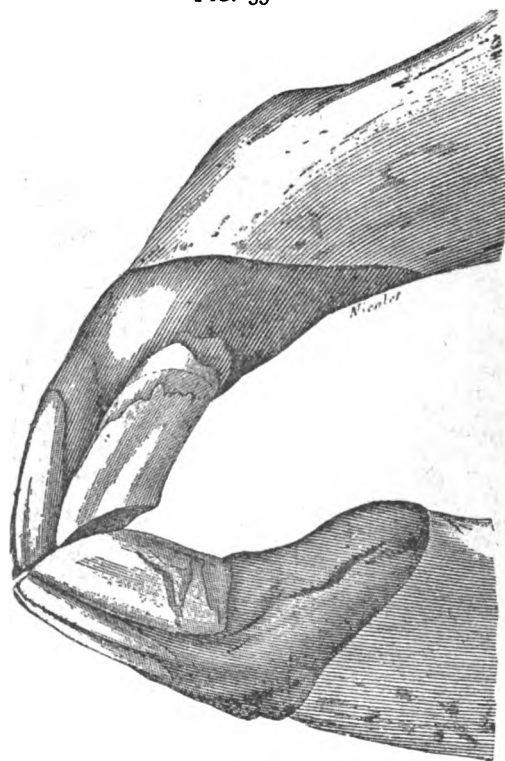


Twenty-one Years.—FIG. 54.

The teeth become so horizontal that, looked at in front, the inferior ones are scarcely seen unless the head is well raised. The triangular interspaces at the base of the superior incisors increase in size and the convergence of the free ends becomes more marked. In profile the jaws are seen diminished in size; the inferior corners have become almost horizontal and have worn off the notch on the superior corner.

The wearing surfaces of these teeth become elongated from in front to behind and have lost their triangular shape. The tables of the superior pinners and intermediate teeth are elongated from in front to behind and distinctly triangular; they are generally leveled. The tables of the inferior teeth commence to flatten from side to side and are more distinctly separated.

FIG. 55.



Thirty years.

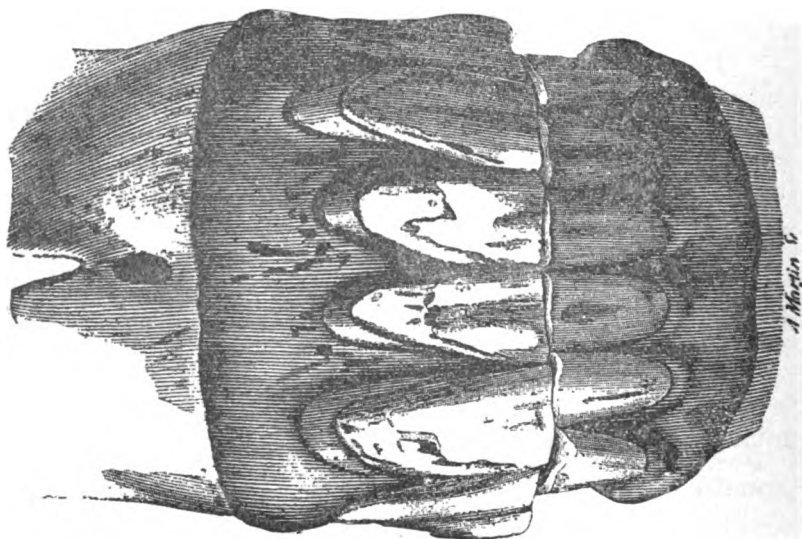
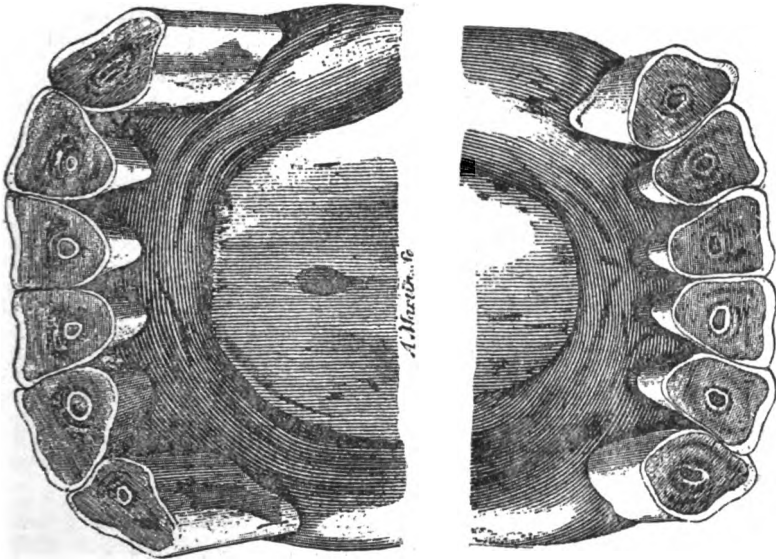


FIG. 55.



Thirty Years.—FIG. 55.

This plate shows the character of extreme old age. In front the superior incisive arch over-laps the inferior, which has become considerably narrower, the convergence of the corner and intermediate teeth becomes more marked. In profile the inferior incisors are almost horizontal especially the corner ones; the jaws are thinned and are wider apart from each other in the region of the bars. The tables of the inferior teeth are flattened from side to side (biangular). The peripheral enamel has almost disappeared from the posterior border of the teeth. In the upper jaw the tables are flattened from side to side and the enamel is nearly worn away. Sometimes in one or in both jaws the teeth have acquired an extreme length and are not leveled; or, at other times they are worn away almost to the roots and level with the gums, and are surrounded by a large deposit of the radical cement which covers the dentine, while the enamel has entirely disappeared.

[TO BE CONTINUED.]

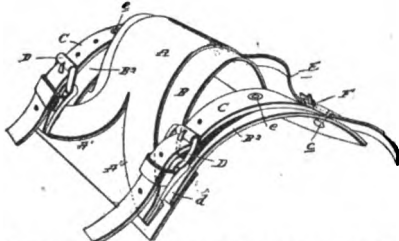
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month of January, 1891.

444,008. COLLAR-PAD. FRANCIS M'LENAUGH, Woodbridge, Cal.
 assignor of one-half to Allen T. Covell, same place. Filed Sept. 5, 1890.
 Serial No. 363,973. (No model.)

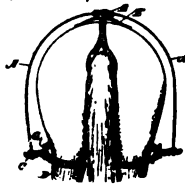


Claim.—The improved collar-pad herein described, comprising the leather B, slitted to form straps B2, the metal ridge A, having its opposite ends forked and secured at each end to the extended corners of said leather, the free ends of the straps B2 lying upon the opposite corners of the leather, as shown, the straps C, secured midway of their length to the straps B2, and

the buckles secured to the legs of the ridge and body-strap, whereby said straps B2 are substantiated at a lower altitude than the ridge and central portion of the leather substantially as specified.

Claim.—A spreader for **444,570. SPREADER FOR GAITING HORSES.** JAMES R. PHILIPS, Sacramento, Cal. Filed Oct. 2, 1890. Serial No. 363,892. (No model.)

horses, consisting of the curved elastic arms, the lower ends of which have straps connected with them to encircle the hind legs of the horse, and a support upon the harness, in which the upper ends of the arms are swiveled or pivoted to turn, substantially as herein described.



2. A device or spreader for horses, consisting of the elastic curved arms having their upper ends movable independently in a support upon the harness, the lower ends connected with straps to encircle the hind legs of the horse, whereby an outward pull is exerted upon the legs and the elastic arms are allowed to oscillate and move in unison with the movements of the horses legs, substantially as herein described.

3. The independent elastic arms having the lower ends provided with straps to encircle the horse's hind legs, a pad adapted to be placed upon the horse's back and having supports or journals in which the upper ends of the elastic arms turn horizontally so as to move independently of each other, and a means of connecting said support with the girth or surcingle and retaining it in place, substantially as herein described.

4. The curved elastic movable arms supported from a pad upon the horse's back, straps connecting with the lower ends of said arms and adapted to surround the horse's legs, and the extending bar G, by which the outer portion of the strap is kept from contact with the outer side of the leg, substantially as herein described.

5. The combination, with the straps D, suspended from arms connected with the harness, of rigid bars within said straps, having end loops or buckles provided with tongues adapted to enter holes in the straps, whereby the straps are adjusted, substantially as herein described.

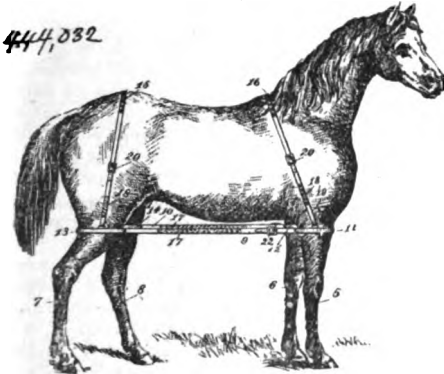
Claim.—1. The combination of a horseshoe having a tapering integral spur provided at its upper end with a loop, an adjustable toe-weight on said spur and having a set-screw, and a strap passing through said loop above the toe-weight, for the purpose set forth.

444,028. TOE-WEIGHT AND QUARTER-BOOT FASTENER. OLANDO J. SUTTON, Seligman, Kans. Filed Apr. 22, 1890. Serial No. 342,065. (No model.)



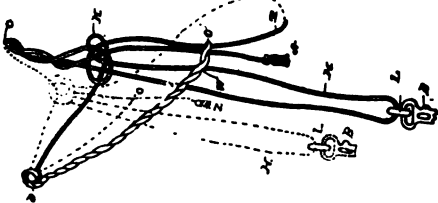
2. The combination of a horseshoe having a tapering integral spur provided at its upper end with a loop, an adjustable toe-weight on said spur and having a set-screw, and a boot having a fastening-strap passing through said loop above the toe-weight, for the purpose set forth.

444,032. HORSE-TRAINING HARNESS. JOHN H. WHITAKER, Davenport, Iowa. Filed Dec. 19, 1889. Serial No. 334,345. (No model.)



Claim.—In a horse-training harness, the combination of straps 9 and 10, each having elastic material incorporated therein, the limb straps attached thereto, and the body-straps, having elastic material incorporated therein, attached to such limb-straps, substantially as described.

444,085. BRIDLE. HENRY S. BREWSTER, Brunswick, Me. Filed July 10, 1890. Serial No. 358,312. (No model.)



Claim.—1. The herein described bridle, consisting of a single piece of rope comprising the crown-piece C, an adjustable headstall H, leading from one of the strands of said crown-piece, throat-latch knots K, each comprising another strand of said crown-piece and the return member of the headstall, and the throat-latch

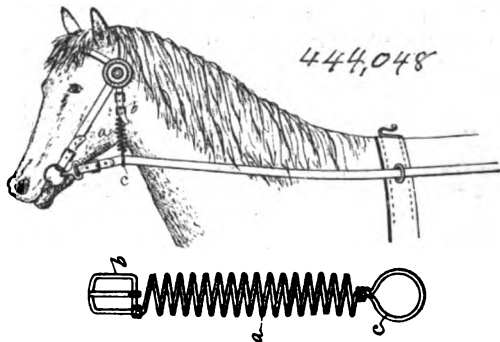
T, leading from said knots, substantially as and for the purpose set forth.

2. The herein described bridle, consisting of a single piece of rope comprising a crown-piece coil C, an adjustable headstall H, leading from one of the strands of said crown-piece coil to the bit and returning to throat-latch knots K, a brow-band consisting of a twist W, embracing said headstall and having loops O at its ends, the second strand of said crown-piece coil centering said side knots K, leading thence through said loops O, and forming the throat-latch T, and the headstall also entering said side knots and leading thence upwardly through a double knot D and into the opposite sides of the brow-band twist W, the whole arranged and adapted for use substantially as herein before set forth.

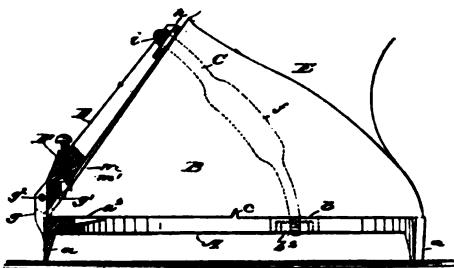
444,048. BRIDLE ATTACHMENT. ANDREW CHEZEM,
Sergeant Bluff, Iowa, assignor of one-half to
Andrew J. Huntley, same place. Filed Sept. 17,
1889. Serial No. 324,261. (No model.)

Claim.—1. As an improved article of manufacture, a coil-spring having an integral buckle-frame at its top end, a tongue attached to the said frame, and an integral ring at its lower end, for the purposes stated.

2. The combination of a coil-spring having a buckle at its top end and a ring at its lower end, the throat-latch of a bridle, and a driving rein, to operate in the manner set forth, for the purposes stated.



445,000. HORSESHOE. HENRY S. BARNOR, Morrisville, Va.
Filed Sept. 19, 1890. Serial No. 365,490. (No model.)

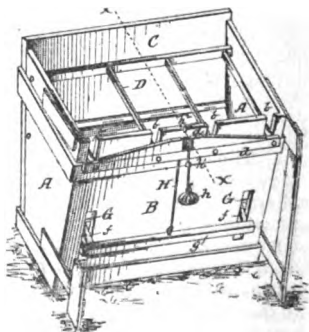
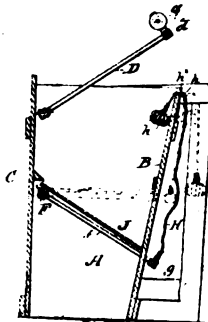


Claim.—The combination, with a horseshoe having calks on its heels and toe, opposite perforated ears on its side limbs an upwardly-projecting lug on its toe, and transverse ribs on its top face entering mating grooves in the hoof, of a locking-bar bifurcated at its lower end and pivoted thereat to the lug on the shoe and laterally enlarged at the upper end and cross-

grooved above said flanged enlargement, an arched clamping-bar having threaded ends passing through the ears on the shoe and provided with nuts, and a set-screw adjustable in the locking-bar near its lower end and provided with a swiveled presser-block having tangs on its lower face, substantially as set forth.

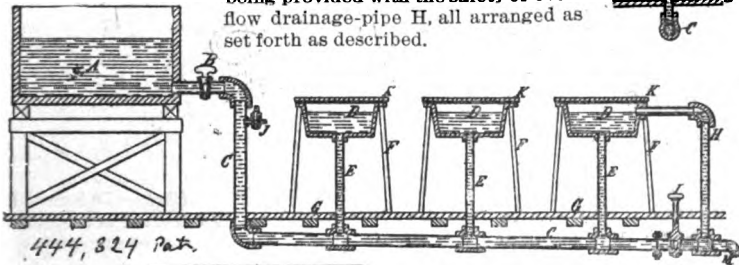
Claim.—The herein-before-specified trough, having notch *h2* in its upper edge and having the slots *G G*, the slot-frame *D*, pivoted at its rear end to the trough and having the pulley *d1* at its front end, the bottom *f*, pivoted at its rear end and having portions projected through the slots *G G*, and the cord *H*, connected with the front end of the bottom *f* and passing over the said pulley *d1*, and having weight *h* at its upper end, and the knot *h1*, substantially as described, for the purpose specified.

444,577. FEED-RACK. JOHN F. FITZGERALD, Trenton, Tenn. Filed Apr. 11, 1890. Serial No. 347,459. (No model.)

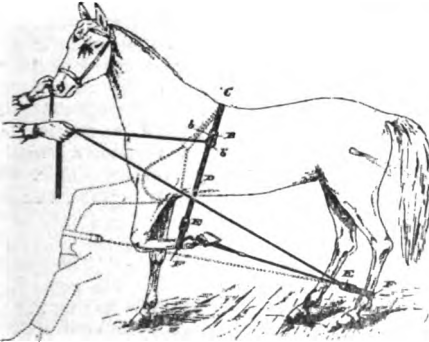


444,324. WATERING-TROUGH FOR STOCK. JOHN ALLIS, Lowville, N. Y. Filed April 25, 1890. Serial No. 349,574. (No model.)

Claim.—An apparatus for watering stock, consisting of the main supply-pipe C, with its vertical branches E E, the former provided with the regulating valves B and I and air-valve J, the branch pipes entering into and connected with separate and individual troughs D D, the last of the series being provided with the safety or overflow drainage-pipe H, all arranged as set forth as described.



444,887. DEVICE FOR HOLDING HORSES. JACOB J. HARMON, Highland, Ohio. Filed Oct. 9, 1890. Serial No. 367,549. (No model.)



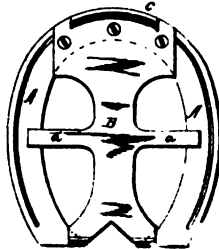
Claim.—In a harness attachment for the purpose set forth, the ropes or flexible connections C and D, connected to each other by clamps A and B, one of said clamps carrying a ring, the rope C, forming a loop adjacent to the clamp A, a strap and buckle having a loop through which the flexible connection D passes, the free end of said rope being passed through the ring carried by the clasp B, substantially as set forth.

2. A harness attachment consisting of a flexible connection C, having an end loop and flexible connection D, clamped to each other, as shown, the connection D, extending beyond the clamp B, in combination with the strap F and auxiliary rope G, having a looped end, for the purpose set forth.

Claim.—1. The combination, with the shoe 31, 1890. Serial No. 380,580. (No model.)

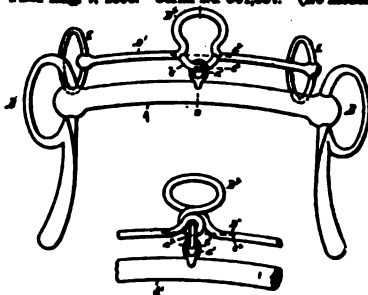
and the lips projecting inwardly from the rear ends thereof, of a pad secured to the front end thereof and engaging with said lips when the pad is under pressure, and lateral arms upon the pad, arching outward and having their free ends in contact with the lower face of the shoe.

2. The combination, with the shoe and the lips projecting inwardly from the rear ends thereof, of a pad secured to the front end thereof and engaging with said lips when the pad is under pressure, and lateral arms upon the pad, arching outward, with their free ends in contact with the lower face of the shoe, and shoulders upon the arms engaging with the inner edges of the shoe when pressure is applied to the pad.

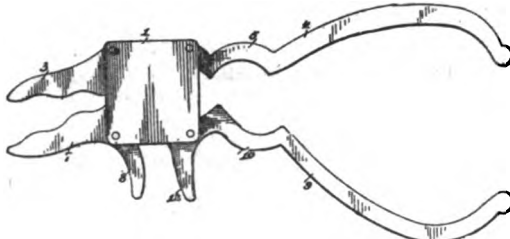


Claim.—In a bridle-bit, the main bit A, an overcheck-bit D1, having a central loop D2 and connected to said main bit by a flexible joint, the central or pivotal point of said joint being between said overcheck-bit and main bit, whereby any downward movement of the horse's head will cause said overcheck-bit to be oscillated upon said flexible joint and cause said loop to be turned upward, but without materially altering the relative positions of the parts A D1, substantially as and for the purpose set forth.

444,425. BIT FOR HORSES. CHARLES F. GUNDMY, Stillwater, Minn. Filed Aug. 7, 1890. Serial No. 361,337. (No model.)



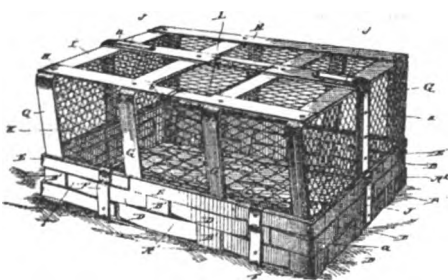
444,428. COW-TAIL HOLDER. EDWIN G. FARMAN, Dover, Me. Filed Feb. 24, 1890. Serial No. 341,802. (No model.)



Claim.—In a cow-tail holder, the combination of the casing-plates, a bar secured between the same and having a jaw and a curved arm extending laterally in opposite directions, a jaw mounted pivotally at the corner opposite to the fixed jaw and having a laterally-extending handle, a curved arm

mounted pivotally at the corner opposite to the fixed arm and having a laterally-extending handle, the lugs extending from said handles past each other, and a spring arranged within the casing and bearing against the inner lug, substantially as and for the purpose set forth.

444,561. POULTRY-CRATE. ROBERT G. THOMASON, Bumpass, Va. Filed Oct. 9, 1890. Serial No. 367,544. (No model.)



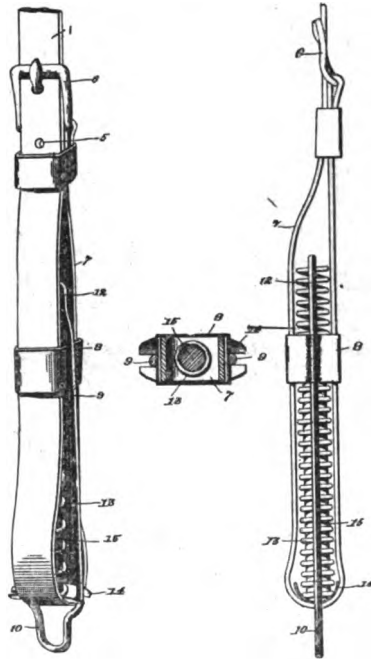
Claim.—1. The chicken coop or crate comprising the bottom having the side and end projecting portions forming the normally up-turned portions or sides and ends of the coop connected together by the short tuck-in corner pieces or strips, and the inner and outer opposite strips or pieces lapping and secured to the top edge strips of the sides and suitably re-enforced thereat, substantially as and for the purpose set forth.

purpose set forth.

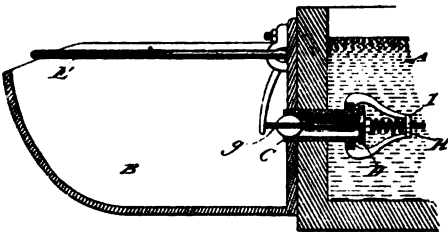
2. The chicken-coop consisting of the bottom wicker-work portion having side and portions held together as described, and having upper and lower bottom re-enforcing pieces or strips, also re-enforcing metallic pieces or strips near their corner edges, the wire netting covered bows with their braces or stays, said bows being secured to said bottom portion, the upright stays or braces secured to said bottom portion, and the end bows and the re-enforcing metal pieces secured to said upright stays and to said bottom portion and to the central top brace of said bows and the central underneath strip or brace of said bottom portion, substantially as set forth.

Claim.—The combination of a check rein folded or doubled upon itself, forming the loop 7, and having means, as a buckle, for rigidly connecting the free end of the strap with the body thereof, the stationary band or sleeve arranged exteriorly on said loop, the bail adapted to be connected to a check-hook and rigid with the sleeve or band, a sliding plate arranged within the loop 7 and guided by the bail, and the cushion-spring housed within the loop 7 and operating between the sliding plate and the bail, substantially as and for the purpose described.

2. The combination of a checkrein folded or doubled upon itself and having its free end rigidly secured to the body of the strap, as by a buckle, to form the loop 7, the stationary sleeve or band fitted on said loop of the strap, the longitudinal bail rigid with the sleeve or band and having one end terminating within the loop of the strap and its other end provided with an eye 10, adapted to engage a checkhook the notched plate arranged within the loop of the strap and fitted between the sides of the bail, the longitudinal rod attached to the sliding plate, and the coiled spring fitted around said rod and operating between the sliding plate and the inner end of the bail, substantially as described.

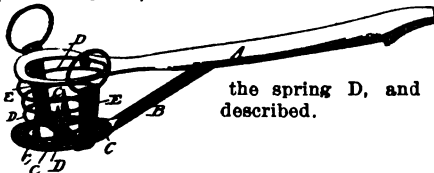


444,911. AUTOMATIC STOCK-WATERING TROUGH. CHARLES A. YORK, Brook, Neb. Filed May 21, 1890. Serial No. 352,673. (No model.)



purpose stated.

444,677. INDEPENDENT CHECK FOR HORSES. CARLO R. TAYLOR, Berlin, Wis., assignor of one-half to Josiah T. Whitcomb same place. Filed Nov. 12, 1892. Serial No. 330,921. (No model.)

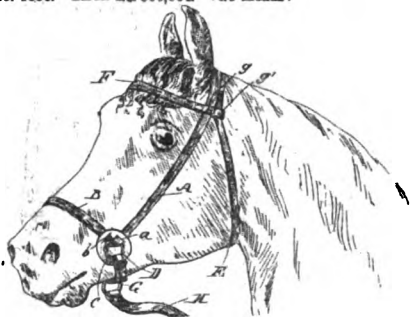


the spring D, and rein-lugs E, substantially as described.

Claim.—In an automatic stock-watering trough, an actuating-bail encircling the upper edge of the drinking-cup, fulcrumed at the rear, the ends there forming a vertically-depending leg resting normally in operative contact with the projecting head of the valve-bolt and adapted to admit water to the cup when bail is depressed by the chin or neck of the animal, substantially as and for the purpose stated.

Claim.—A chin-plate A, notched at its upper end, having an orifice at its lower extremity, and having attached thereto the spur-plate B, provided with spurs, the spring D, and rein-lugs E, substantially as described.

Claim.—A halter comprising a head-band, a throat-latch strap connected with the ends of the head-band, the check-guards C C1, having two slits *a b*, the check-straps A A1, passing down through the brow-band and loosely through the slits *a b* to form the nose-band B, the loose rings D D1, suspended on the loops *e*, formed by the portions of the straps A A1 where they cross the guards C C1 between the slits *a b*, and the curb-strap G, connecting the two rings D D1, substantially as set forth.

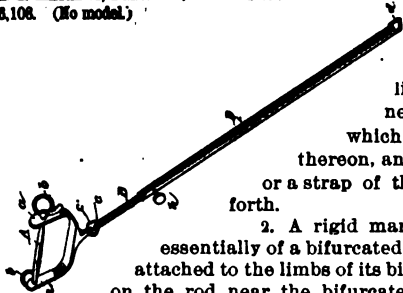


444,648. MARTINGALE ATTACHMENT FOR HARNESS. STILLMAN E. MATHEWS, Fullerton, N. Y. Filed Sept. 25, 1890. Serial No. 369,106. (No model.)

Claim.—1. A martingale attachment for harness, comprising a rigid

rod which is forked at one end, has a bit-bar across the limbs of the fork that may be connected to a bridle, and a sleeve which slides on the rod, is securable thereon, and attachable to the breast collar or a strap of the harness, substantially as set forth.

2. A rigid martingale for harness, comprised, essentially of a bifurcated rigid rod having a bridle bit-bar attached to the limbs of its bifurcated portion, a knuckle joint on the rod near the bifurcated end, and a rigid sleeve that is adapted to slide on the rod and be secured thereon at any point of longitudinal adjustment and also attachable to the breast-collar or strap of the harness, substantially as set forth.



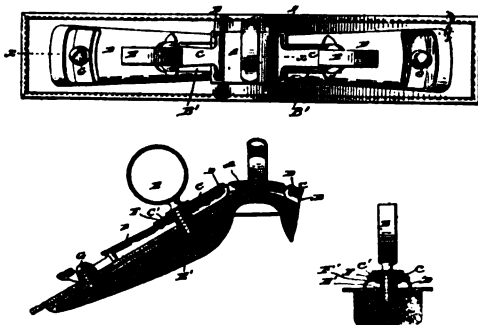
444,761. HARNESS-SADDLE. WILLIAM O. MILLER, Quincy, Ill. Filed May 19, 1890. Serial No. 352,375. (No model.)

Claim.—1. In a harness-tree, the combination, with the check-hook plate provided with loops, eyes, or slots as described, of the metal side plates provided with the hooks and terrets passed through said hooks, substantially as described.

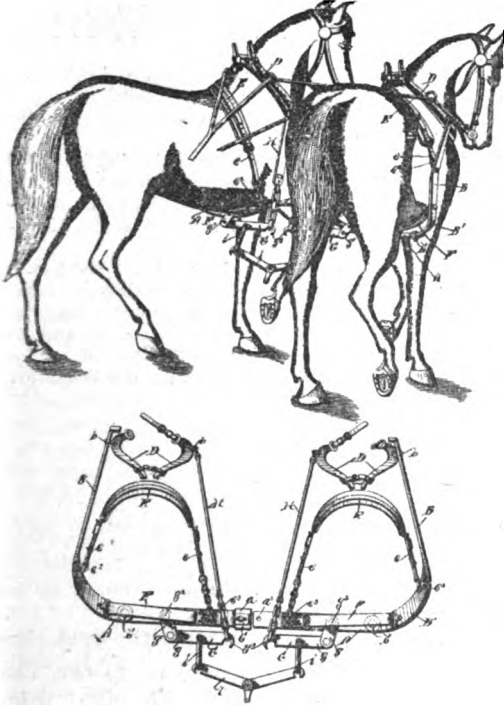
2. In a harness-tree, the combination, with the check-hook plate provided with loops, eyes, or slots as described, of the metal side plates having the hooks the

bridge pieces beneath the hooks, and the terrets passing through the hooks and said bridge-pieces, substantially as described.

3. The side plate provided with a hook, as described, and made open or cut away beneath the hook, in combination with the shouldered bridge-piece located beneath the end of the hook and seated in the opening in the plate and with the terret, substantially as described.



444,401. HARNESS. DE WANE B. SMITH, Deerfield,
assignor of one-half to Charles H. Poole, Utica, N.Y.
Filed Feb. 23, 1890. Serial No. 342,129. (No Model.)



Claim.—In combination with the traces and saddles of a double harness, the herein-described rigid cross or draw bar connected to said traces and saddles and composed of separable divisions having their inner extremities approximated, and a movable catch for engaging said extremities and removably securing them together, whereby a team may be harnessed singly, substantially as and for the purpose specified.

2. In combination with the traces and saddles of a double harness, the herein-described cross or draw bar connected to said traces and saddles and composed of separable divisions having their inner extremities approximated, and a spring-actuated slipping rod secured to one of said divisions and removably engaging the other for removably securing together said divisions, whereby a team may be harnessed singly, substantially as and for the purpose set forth.

3. In combination with the traces and saddles of a double harness, the herein-described cross or draw bar connected to said traces and saddles and composed of separable divisions, a socket provided on one of said divisions and adapted to receive the end of the other division, and a catch for removably securing said parts together, substantially as and for the purpose specified.

4. In combination with the traces and saddles of a double harness, a metallic cross or draw bar connected to said traces and saddles and adapted to be placed beneath the horse, and a strap above said metallic cross or draw bar adapted to be imposed between the horse and the said bar and having its opposite extremities secured to said cross-bar, substantially as and for the purpose specified.

5. In combination with the traces and saddles of a double harness, a metallic cross or draw bar connected to said traces and saddles and composed of separable divisions having their inner extremities removably secured together, whereby a team may be harnessed singly, and a strap above said cross or draw bar adapted to be imposed between the horse and said bar, substantially as and for the purpose set forth.

6. In a harness, the combination, with the collars, of a double harness, metallic traces loosely connected at their forward extremities to said collars, a cross or draw bar loosely pivoted to the rearward extremities of said traces, and a saddle for supporting said cross bar, substantially as specified.

7. In a harness, the combination, with a collar, a cross-bar, and a saddle for supporting said cross-bar, of a metallic trace having its forward end connected to said collar, and having its rearward end deflected below the plane of its forward end, and laterally-extending arm provided on said rearward end and connected to said cross-bar, substantially as specified.

8. In combination with the collars and saddles of a double harness, the combination of metallic traces loosely connected at their forward extremities to said collars, a cross or draw bar loosely connected to the opposite extremities of said traces and composed of separable divisions, and a catch for removably securing together said divisions whereby a team may be harnessed singly, substantially as and for the purpose set forth.

9. The herein-described harness, composed of a pair of saddles and collars, a cross or draw bar connected to the saddles, outer metallic traces pivotally secured to said collars and cross bar, single whiffle-tree connected to said single whiffle-trees, substantially as and for the purpose specified.

10. The herein-described harness, composed of a pair of a pair of collars and saddles, a cross or draw connected with said saddles, outer metallic traces pivotally connected to said cross bar, single whiffletrees, links connecting the said whiffle-trees and cross-bar, and a double whiffletree connecting to the said single whiffle-trees, substantially as and for the purpose set forth.

11. The herein described harness, composed of a pair of collars and saddles, a cross or draw bar connected to said saddles and composed of separable divisions, and a catch for removably connecting said divisions, whereby a team may be harnessed singly, outer metallic traces pivotally connected to said collars and to said bar, single whiffletrees, links between the said whiffletrees and cross bar, and a double whiffletree connected to the said single whiffletrees, substantially as and for the purpose set forth.

EDITORIAL DEPARTMENT.

We beg to inform our readers that the contract with Dr. A. L. Hummel for the publication of *THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES* having expired this periodical will now be published by W. R. Jenkins, the well-known publishing firm of No. 851 and 853 Sixth Avenue, New York city.

It is requested that all communications be forwarded to the managing editor, Dr. R. S. Huidekoper, corner of Park Avenue and 42d Street, New York city, or in care of W. R. Jenkins. It is the aim of the editors to keep the Journal up to the same high standard as heretofore and also to introduce several new features, one of which will be found in this number giving illustration of the various improvements in all articles necessary for the care of live stock which have been protected by our government.

WANTED BACK NUMBERS.

We will pay twenty-five cents each for a few copies in good condition of No. 2, Vol. IX, February, 1890.—EDITOR.

SOCIETY PROCEEDINGS.

Indiana Association of Veterinary Graduates.—The Annual meeting of the Indiana Association of Veterinary Graduates was held in Indianapolis on January 7th and 8th.

On the evening of the 7th the meeting was called to order at 8 P. M., neither the President nor Vice-President were present, Dr. Macaulay was called upon to take the chair until after the election of officers for the coming year.

The minutes of the previous meeting were read and approved and after preliminary business had been attended to the election of officers took place, with the following result :

For President, Dr. J. Rodger, of Anderson.

“ Vice-President, Dr. G. Ferling, of Richmond.

“ 2nd “ Dr. J. Culbert, of Portland.

“ 3rd “ Dr. G. Buckner, of Rockville.

“ Secretary, Dr. H. Macaulay, of Indianapolis.

“ Treasurer, Dr. E. Diggs, of Winchester.

The newly elected President, Dr. J. Rodger now took the chair and the first paper of the meeting was read by Dr. E. Diggs on rheumatism. He considered it an acute febrile disease brought on by obscure climatic and diatetic influences, and characterized by pyrexia sweats and acute shifting inflammation of the joints and other structure. The essayist places the greatest stress on the heredity of the trouble and says that 27 per cent. of all cases can be traced to that cause. Of the other great causes the most important are exposure to cold and wet, and it is frequently a sequence of influenza.

Dr. Diggs then went on to show the anatomical changes found in diseased joints, but believed that when death occurred from rheumatism it was due to complications with the organs, particularly heart, pleura or lungs. If there has been hyperpyrexia before death the blood is fluid for a considerable time after, and the liquor sanguinis is alkaline and there is no increase in uric acid—lactic acid.

In treating of the pathology of the disease the essayist mentioned it was very obscure, but gave the theories advanced by a number of eminent authorities, the majority of whom give lactic acid as the chief reason some others say it is due to a germ, etc. Dr. Diggs expressing his belief that it was not due to a micro organism. He then detailed some cases he had had in practice; his treatment in such cases being nitrate of potash—salicylate of soda and valerianate of morphine when necessary.

Dr. Thompson inquired of essayist how he distinguishes between acute rheumatism and osteo porosis? The questionsr saying he had had many cases where he had found it impossible to distinguish between the two excepting by an examination of the urine. If urine was acid it was rheumatism, if alkaline osteo porosis.

Dr. Culbert.—Had Dr. Diggs ever noticed any cracking of joints No. Did he not think hot water very beneficial in cases where joint was effected? Yes, and essayist often used in cases of severe pain in a joint a liniment of aconite, belladonna and camphor with oil.

Dr. Ferling believed in the beneficial effect of hot water, as he could speak from experience, being a martyr to rheumatism.

Dr. Macaulay in his treatment always gave brisk cathartic and followed this generally with nitrate of potash and soda salicylate. Had had two cases of osteo porosis during the year, but had no difficulty in diagnosing; believed that in rheumatic cases the pain and lameness came on suddenly, while in osteo porosis the lameness was gradual and constantly increasing, and not so inclined to shift.

Dr. Roberts does not believe in large doses of sal soda, but prefers to give 3ss doses frequently and in combination gives diuretic and aconite.

Dr. Thompson mentioned that he had never seen a case that occurred where a horse stood on a board floor, and believes that the damp earth was frequently a cause of the trouble.

Dr. Rodger never gave aloes in rheumatism, but preferred sulphate of magnesia, followed by nitrate of potash and colchicum.

Dr. Sheffer believed in good hygienic surroundings while treating.

The meeting then adjourned until 9 o'clock the following morning, when it was called to order, the President, Dr. Rodger in the chair.

Dr. Macaulay then read his paper on "Counter irritation versus cold applications in Pneumonia."

The essayist took up the nature of pneumonia so that the effects of the two applications might be the more thoroughly understood. The starting point in pneumonia occurred when the animal was said to "chill," the chill being of nervous origin and defined as "a prolonged depression of nerve force without the reaction which should occur immediately after the collapse." In the case where a "chill" occurs the action of cold air on the cutaneous nerves has been so severe that the afferent impulses have for a time paralyzed the nerve centres so that control is lost over the vaso-constrictor centre and the consequence is the caliber of the blood-vessels is constricted and less blood is carried in them. This condition of affairs is followed by the "re-action" when the nerve centres recover from the shock and reassert command over the vaso-constrictor centre so that the blood again flows freely through these vessels that were constricted, and it is here the crisis occurs. If the action of the cold has not been too depressing in its effects the minute nerves once more take command over the capillaries and all goes on well. If, on the other hand, the depressing effect has been too severe these nerves are not able to assert command over the walls of the capillaries, these then distend overmuch and fill with blood and we have what we term congestion, and when the congestion is in the lungs it is followed by inflammation. Dr. Macaulay then mentioned other changes noticed with the inflammation, and in speaking of the increased heart beat and increased respiration, while believing that the first was partially due to lack of resistance of blood pressure and the second to less lung structure having to do more work, yet was sure if the result of these actions on the diseased part was studied, nature would be seen trying to rectify things by

forcing the blood through the congested vessels with the increased heart beat and the increased respiration by contraction and expansion of lung helping the heart by mechanically forcing the blood along.

The physical symptoms of pneumonia were then spoken of and then the action of counterirritants on the disease.

The first action of the counterirritant on the nerves causes a constricting of the vessels, this being quickly followed by enlargement and engorgement with blood. Up to this point the essayist remarked that the results of the action of the cold and of the blister had been very similar. The pain caused by the counterirritant was then dealt with, the essayist mentioning that pain must be due to injury of the nerves, and continuing referred to an able paper by Dr. White, lecturer at Guy's Hospital, London, in which all pyrexias were believed to be of a nervous origin. Dr. Macaulay believed that the pain must necessarily increase the temperature and aggravate the disease. True, there was an external "reservoir" formed for the blood, but the pain caused by the counterirritant was shown by great uneasiness of animals, but that when the intensity of the pain has worn off, the animal becomes stationary and moves the area over which the counterirritant is as little as possible; the consequence being that the upper part of lung does more work, while lower or diseased part does less, and because of this the blood stagnates much more readily, and the pain is thus making the lung exactly contrary to nature's dictations. The enforced rest caused by a counterirritant the essayist believed to be of great benefit in a great number of cases, but the lungs were organs that had to go on with their duty day or night, and whatever tended to interfere with that function aimed directly at life of animal. The essayist believed many an animal recovered that had been blistered, but that the recovery was in spite of the blistering.

At this point the essayist compared the treatment of pneumonia of by-gone days and the treatment of to-day, referring to the difference in blanket-ing and keeping room close and hot, but more particularly to the change in the administration of drinks. Formerly water had to be warmed, now it was cold; the demands of nature, as seen by the patient's desires, being attended to. The hot and cold water must be much the same in their compositions; if anything the heated water was purer, and this being so, the difference in their action on the patient must be purely mechanical, the cold reducing the animal's temperature much the same as a cup of cold water would reduce the temperature of a basin of warm into which it had been poured. When looked upon in this light the essayist thought it forcibly suggested the use of cold water externally, the action of a blanket wrung out of cold water and applied to the chest and covered with a dry blanket would be two-fold. The first action of the cold on the nerves would be the same as the blister, there is a contraction of the blood vessels, followed when the reaction comes by the distention of the capillaries, and secondly, the mechanical effect of the cold blanket drawing the heat from the body until all is warm. The essayist believed it could be done a number of times, the change of blankets being expeditiously done and the thermometer guiding when to stop.

The *Pneumo-cocci bacillus* is put down as the cause of the trouble very frequently, and essayist believed it frequently could be found especially in

cases following influenza but even here the cold water by reducing the temperature was beneficial, as it is well known the bacilli thrive more heartily when the temperature is higher than normal;

Discussion followed: Dr. Thompson thought cold applications contra indicated as cold had been the primary cause of the disease, enquired of essayist if he would take a patient with a temperature of 106° and lead him to the street on a cold day, so that patient might have beneficial effect of cold wind to lower his temperature, believes that if a little cold would do good in a fever, considerable cold should do more. Answer. The cases are in no way parallel. In the one the application of cold in the form of a wet blanket, covered with a dry one, the amount of cold is limited and the bulk of animal's body in its heated condition will heat the wetted blanket. The shock here cannot be so severe as to cause a chill when the reaction occurs. By using the cold to side we are nearly following out nature's promptings when she caused the patient to crave for the cold water rather than the hot.

Dr. Culbert.—Thinks the cold good, but to facilitate the changing of blankets or do away with the changing entirely, would recommend the use of bags such as Dr. J. Mager's patent.

Dr. Diggs.—Does essayist consider the use of cold applications to be of benefit in congestive stage? Yes, when temperature is high.

Dr. Roberts.—Does not favor use of blister. It prolongs case that might be cut short. Considers blistering merely a way to make a large bill on owner.

Dr. Culbert.—What internal treatment do you recommend? Ans. Any antepyrctic medicine. Quinine. Acetanilide, Sal-soda, potash nitrate, etc., should work well in conjunction with cold-applications.

Dr. Shaffer.—Never used any external applications but believes with Prof. Williams that in stagnating cases, blisters by rousing the whole system might be beneficial.

Dr. Thompson.—Believes blister to be of service where pleura is affected but not when lung substance itself is.

Dr. Culberts.—Only objection to the cold water treatment is that we have not as good surroundings for our patients as medical practitioners, regarding blistering does not think he has ever killed any with it but certainly believes he has prolonged cases.

The meeting was adjourned until after dinner and met again at half-past one. Dr. M. Knowles in a short address moved, Dr. A. Thompson seconded, that the following resolutions be passed.

First. That Dr. F. Billings be made an honorary member of this Association.

Second. Resolved that it is the sense of the Indiana Association of Veterinary Graduates that the investigations of Dr. F. S. Billings on contagious and infectious animal diseases have been the only investigations of merit made in these United States.

And be it further resolved that we feel indebted to Dr. Billings and the State of Nebraska for these investigations. And be it further resolved that since the State of Nebraska had Dr. Billings in her employ at the time these investigations were made and that in our belief Dr. Billings can give the Agricultural and Scientific world farther enlightenment on infectious and

contagious diseases, we therefore request the State of Nebraska to re-employ Dr. Billings for said investigation.

Be it further resolved that a copy of these resolutions be sent to Dr. Billings and the State University of Nebraska, and that they be spread on the minute book of this Association.

These resolutions were passed unanimously and it was just at this moment Dr. Macaulay arrived. and at the request of Dr. Knowles the President read the resolutions over for his benefit.

Dr. Macaulay was sorry he had been detained so as to have been unable to have been present when these resolutions had been moved, as he considered it was something with which we as a Society should have had nothing to do. He understood that Dr. Billings's views on many subjects, were at variance with a majority of our leading veterinarians, and by siding with Dr. Billings in this case we were making ourselves antagonistic to them. If any such set of resolutions were to come before the association he believed they—the members—should have been warned of it in order to satisfy themselves that if they took any steps at all it would be in the right direction. The resolutions were passed and his protest he knew amounted to nothing, but he made it nevertheless.

Dr. Bell was then called upon to read his paper on "Rare Cases in Practice," and reported a case of Tenotomy in a colt, 4 months old, that had contracted tendons in all four legs, the right front one being so much contracted that the colt's toe only touched the ground, the other three were also much contracted but not so much as the right. Dr. Bell made his case very interesting by having cuts of all the different positions the legs were in. On the right front leg the incision was made half way between knee and fetlock and both perforatus and perforans were divided in the usual way, antiseptic precautions being taken, and cut after operation being filled with Quinine Sulphate, a pledget of cotton, and leg lightly bandaged. This made colt almost bring fetlock to ground.

Four weeks after first operation the left foreleg was operated on using no antiseptic precaution but injecting a four per cent solution of cocaine. As this leg was not so much contracted the perforans only was severed, and on stretching the leg forward the cut edge of the tendon separated about one inch. In this case the wound was dressed with Quinine Sulphate. On being let up the colt's foot came down in a natural position. In all cases the heels were lowered before operating and toes left long. Both the hind legs were also operated on without any antiseptic precaution, and although one was not bandaged there was no difference noticed in their healing.

The first operation was during the latter part of August and at present the colt is sound on three legs, but still somewhat down on the right foreleg, but a good recovery is expected since that leg is now in a shoe made expressly for it.

Dr. Thompson believed the right front leg would have done better if left entirely alone after the operation, he has had such cases and they ultimately came to natural position. Believes it is proper in such cases to raise heel rather than cut it down.

Dr. Knowles.—Believed that if right front leg had been let alone it would have come all right in time.

Dr. Roberts.—Had had three cases of cut tendons—one accidentally cut—died. His second case was in a large draft horse. After operation a shoe such as Dr. Bell describes was applied and in six weeks horse was at work. In third case no shoe was put on and foot went down and stayed down.

The essayist mentioned here that the colt had not been born with contracted tendons for legs were natural and puffy the week before contracting.

He also uses quinine in all new cuts as in cases treated that way there is not one tenth amount of suppuration, and wounds generally heal by first intention.

Dr. Thompson now read his paper on "Administration of Medicine."—The essayist first impressed upon his hearers the necessity of the purity of the drug employed—especially when we know there are so many adulterations. The strength of the drug we use is also of vital importance, and Dr. Thompson believes fluid extracts should in all cases be used in preference to tinctures, as tinctures vary in strength in every different drug house. The administration of medicines in bolus form the essayist considers very unsatisfactory and especially so when chloral is to be given, he knowing of two cases where a capsule so given lodged in the fauces and dissolved there, death resulting in both cases—believes many gelatine capsules never dissolve in the horse at all and pass out as administered.

The quantity of medicine administered should always be minimum dose for desired effect, and in this respect practitioners are not careful enough, and also considers it wise for the practitioner to attend to the actual giving of medicine as possible and not to trust to grooms. In cases of Indigestions or Colics, the essayist says, it must be remembered that absorption is very slow and it is therefore better to give medicine hypodermically or intravenously. In any case where liquids are to be given use hard rubber syringe. Dr. Thompson considers Enemas almost valueless.

The essayist has had good results from tapping in cases of flatulent colic and injecting into bone per camula from four to six ounces of glycerine, believes it stops short formation of gas.

Believes that only in Tetanus is administration of medicine per rectum preferable to other methods, and in this case form your medicines into small suppositories and insert by means of long dressing forceps.

Dr. Bell does not see how so large a thing as a capsule can pass through the pyeoric orifice of stomach unless digested or dissolved.

Dr. Bell.—How do you give aloes? In solution.

Dr. Macaulay.—In giving medicine two things have to be considered, the man and the patient. Believes the quieter we can give medicine say to a feeble patient the more good it will do as the patient is not excited and does not fight, for this reason always use a hard rubber syringe. When properly administered the animal takes it quietly and the giver is not besmirched as by bottle. Has never found Aloes and Calomel together dangerous.

Dr. Roger now read his paper on Indigestion.

The essayist enumerated the causes of the trouble—dentition sharp molars—inferior food. In young animal form method. Believes more common in draught-stock as stomachs in these are smaller than in many

lighter breeds and in these heavier horses there is more impaction and these cases generally are fatal. The symptoms were chiefly shown by eructations of gas, quicker breathing and pain.

In treatment essayist is very fond of Pilocarpine, injections into trachea in from 1 to 2 grain doses, considers that in this dose it acts as a narcotic, depressant and cathartic also likes the action of Linseed oil, Turpentine and Aqua Ammonia, does not care for morphine because of its stopping the action of abdominal viscera. Uses enemas to hurry action of bowels.

Dr. Shaffer.—Does essayist ever use Pilocarpine with Eserine? No, because sweats are already profuse enough, combines Eserine with Atropia.

Dr. Feiling.—Does horse ever vomit and recover with you? No. Dr. Feiling relates a case where the regurgitation took place and animal was well and eating hay in half an hour.

Dr. Macaulay.—Very partial to Pilocarpine Charcoal and Sal Soda when eructations are present. Never had used Eserine in cases of indigestion but in cases where it was used always combined Pilocarpine as it appeared to lessen the severe griping of the eserine alone.

Dr. Culbert.—Does essayist give Eserine when animal is weak? No, it is too depressing. If there is no response to eserine give oil.

Moved by Dr. Feiling, seconded by Dr. Diggs, that the next meeting of the Association be held at Richmond in June. The date yet to be decided on.

The President then named essayists for next meeting.

The meeting then adjourned.

H. R. MACAULAY, *Secretary*.

Ohio State Veterinary Medical Association.—The eighth annual meeting of the Ohio State Veterinary Medical Association was held in Wells Post Hall, Columbus, January 14, 1891. The meeting was called to order at 2 P.M., with President Geo. W. Butler in the chair. The following members were in attendance: J. S. Butler, T. B. Cotton, J. Charlesworth, W. F. Derr, W. C. Fair, T. B. Hillock, W. R. Howe, W. A. Labron, A. H. Logan, J. M. Waddell, T. Kerr, Walter Shaw, W. H. Gribble, W. Torrence, J. D. Fair, N. C. McLean, C. Christman, E. H. Shepherd, E. C. Barnett, and also Drs. Jones, King, and Bretz and Prof. Townsend.

The minutes of the previous meeting were read and approved. Dr. Geo. W. Butler, the president, then rendered his annual address in a novel and somewhat poetical manner.

Nomination and election of officers followed which resulted as follows: President, W. R. Howe, Dayton; 1st Vice-President, E. H. Shepherd, Cleveland; 2d Vice-President, J. W. Fair, Berlin; 3d Vice-President, M. C. McLean, Jeromeville; Secretary, W. H. Gribble, Washington, C. H.; Treasurer, T. B. Hillock, Columbus. The following graduates were proposed for membership: Dr. Neil Jones, of Chilicoth, vouched for by Drs. Shaw and Butler; Dr. F. J. King, vouched for by Drs. Butler and Howe; Dr. S. Bretz, vouched for by Drs. Cotton and Hillock. A ballot was taken, and all three were declared elected. Each new member in turn was called upon for an address, and responded in a few brief remarks

Correspondence. A letter from Prof. Liautard stating his regards for the Ohio society and offering to print minutes of meeting. A vote of thanks were then given Dr. Liautard.

The secretary next read a communication from Dr. Kinsman, Sec'y of the Ohio State Live Stock Com., in response to Drs. Butler's vote of censure passed at the July meeting. The communication showed that the state commission did not have so much authority vested in it as had been presumed and denied that the commission had been negligent in its sworn duties. The communication was well received until the final paragraphs were reached when Dr. Kinsman took occasion to slur the Veterinary profession of Ohio, on the ground of too much disagreement, this slur being entirely uncalled for, as the profession of which Dr. Kinsman is an honored member, can certainly not boast of agreeing on diagnosis in every case; especially is this shown in suits at law for malpractice. A heated discussion followed in which Drs. Fair, Butler, Cotton, Shaw, Hillock, and Gribble took part. Moved, by Dr. Gribble, seconded by Dr. Wight, that this discussion be postponed until later and that Dr. Kinsman be especially asked to be present. Carried. Dr. Fair urged hearty co-operation between the Veterinary profession and the Live Stock profession and the Live Stock Commissions. He could not say he had been treated with justice, but he desired unity. Dr. Cotton gave his experience with the commission. Dr. Gribble said they had been very prompt in aiding him in an outbreak of Glanders.

Dr. J. C. Meyers, Sr. then read a paper, "Tracheotomy and Laryngeal Injections in Affections of the Throat." He exhibited a tracheotomy tube to be used in cases where it was expected that it would not be needed for more than a few days; the tube is in the form of a trocar and canula and is passed through the trachea transversely and retained in place by set screws. The paper was received with applause. Dr. J. S. Butler asked if such injections would not benefit chronic coughs. Dr. Meyers cannot see why not if sufficient care be used to wash the mucous membrane.

Dr. Newton described a case of abscesses following use of tracheotomy tube, with fatal termination. Dr. Meyers thought the abscesses to be the result of false membranes, &c.; others that the case was irregular strangles. Dr. Charlesworth reported a case where constriction or rather a flattening of the trachea followed the use of a tube, it was operated on twice to relieve the complication and at last was cured by use of a long, round silver tube being kept in the trachea until it adjusted itself to the shape of the tube. Dr. Fair said less trouble would result if none of the rings of the trachea were completely severed, he removes about half of two different rings.

Dr. Butler read from the London *Journal* a report of a case where the epiglottis had become misplaced and held by the *velum palati*.

Dr. Shepherd read an essay on "Hypo Sulphite of Soda." It elicited considerable discussion especially as regards its use in skin diseases and gastric fermentation. Dr. Torrence gave his experience in treating these troubles with Chloro-naphtholum, stating this latter drug to be a deodorizer and disinfectant. A discussion on the treatment of Azoturia was taken up by Dr. Wight, Meyer, Derr, Newton and others, which showed the variable fatality in different districts. Some members expected when the animal

was prostrated it was as good as dead. Dr. Derr had a case to which he had called Dr. Wight and others where paralysis followed the disease and where after nine months treatment the case recovered and is working to-day, but covered with scars from bed sores.

Meeting adjourned at 6 P. M.

Evening Session.

Meeting called to order with Dr. Shepherd in the chair.

An essay by Dr. Cotton was read on remedies for Parturient Apoplexy. His pet prescription is ;

R

Spts. Ammon. arom. $\frac{3}{4}$ x
Spts. Ætherus Nii. $\frac{3}{4}$ xx

Sig. \mathfrak{z} iii every half hour for five hours ; or every one hour for five hours.

He also gives Magnes. Sulp. \mathfrak{z} xxiv. Large doses of stimulants were, in his opinion, curative, to be followed with Nux Vomica, if necessary, and injections. Drs. Shaw, Butler, Torrence, Derr, Newton, and Townsend lauded Oleum Tigllii, even when deglutition was paralyzed.

Place for the next meeting was now discussed. Moved by Dr. Torrence, seconded by Dr. Hillock, that the President, Secretary, and Dr. Newton correspond with the officers of the Michigan State association and mutually agree to meet with them at some place and time during the summer. Carried.

Committee on contagious diseases rendered report. Dr. Hillock was of opinion that actinomycosis is contagious and cited several cases in proof.

Drs. Shepherd, Torrence and Fair, gave description of an outbreak of Stomitis in Cleveland. Dr. J. D. Fair believed in a volitile virus in Glanders.

Dr. Gribble could not believe in such a virus, had had experience with the disease and was well satisfied that it resulted from inoculation, in fact had never seen a case wherein there was a particle of proof to sustain spontaneous origin. If he believed as Dr. Fair, Ohio would have one less veterinary surgeon in its employ for fear of infection.

Dr. Fair presumed no one would be a week making the examination. His idea was not championed by any other member present.

Dr. Howe reported several cases of death on one farm. Animals would be dumpish, inclined to stay in one place, temperature and pulse about normal, from examination of them one would not think the animals sick, but their facial expression showed otherwise, there was some paralysis, groom claimed inability to swallow, youngest died first, old horses lived several days. Post Mortem (gross) revealed nothing to satisfy him.

Dr. Hillock suggested diphtheria.

Dr. Fair corn stalk disease.

Dr. Buter thought the fact of diphtheria was not sustained in the horse.

Dr. Hillock said the dogs and cats of Columbus are now having an epidemic of diphtheria.

A discussion as to asking veterinary legislation was entered into, but finally decided to be let alone as it was useless to expect any help.

Dr. J. S. Butler stated he had sold his practice and was about to move west, and asked to withdraw from the association. Dr. Newton moved and Dr. Torrence seconded that Dr. J. S. Butler be elected an honorary member of this association. Carried.

Dr. Gribble offered amendment to constitution, viz., that hereafter officers do not take their respective offices until at the close of the meeting at which they are elected.

Bills were allowed, and Treasurer reported about \$300.00 in treasury.

The association adjourned to meet with Michigan society on the order of the President and call by the Secretary.

WM. H. GRIBBLE, *Secretary.*

Long Island Veterinary Society.—A regular meeting of the Long Island Veterinary Society was held on January 21, 1891, at No. 74 Adam St., the President, Dr. Roscoe R. Bell in the chair.

The following members were present, Drs. Geo. H. Berns, Roscoe R. Bell, Geo. F. Bowers, H. Housman, Samuel Atchison, D. S. Breslin, Philip Newman, Wm. H. Pendry. The minutes of the previous meeting were read and approved.

The Board of Censors made no report.

The next order of business, reading of papers, the secretary read a communication from the essayist Dr. Geo. G. Vanderveer, stating his inability to attend the meeting but forwarding paper on Leukaemia. It was moved and seconded that the communication be received and that the secretary read the paper. Carried

After the reading of the paper it was moved and seconded that the discussion of the paper be postponed until the next meeting. Carried.

The meeting then adjourned.

D. S. BRESLIN, *Secretary.*

Keystone Veterinary Medical Association.—The Keystone Veterinary Medical Association held its meeting at College of Physicians, January 3, 1891, President, Dr. Hoskins in the chair. Drs. Zuill, Goentner, Glass, Huidekoper, Weber, Kooker, Eves, Harger, Ridge, Lusson, R. Formad and Drake answered roll call. Minutes of previous meeting were read and approved. The Board of Trustees reported: "In the case of Dr. Huidekoper we beg leave to report as follows: That he issued his statement to his patrons as he found them on his ledger, to veterinary surgeons of his acquaintance, to livery stable keepers who should know of his change of office days and hours and to personal friends. We consider that his having been chosen to a chair in the American Veterinary College and being compelled to be in New York, three days in a week, he was justified in making the announcement. As to the clause "Examination for soundness and diseases of dogs a speciality," we are of the opinion that Dr. Huidekoper has violated no section of the code of ethics, in view of the fact that he issued this as a communication to his patrons and not as an advertisement."

On the question of legality of a member of this association holding a position on the staff of the Veterinary Department of the University of Pennsylvania.

We report that the question of legality, is not one for us to decide; but we disapprove of a member of this association serving on the Board of Managers. The fact of any member continuing in the position shows that he acquiesces in the free treatment advertised by this institution; the principle of which we consider wrong and deserving of censure.

Signed

S. E. WEBER, L. O. LUSSEN,
W. S. KOOKER, H. R. EVES.

The trustees reported favorably for membership Drs. A. F. Sellers and A. F. Schreiber. The report received, and the part adopted relative to Drs. Sellers and Schreiber becoming members. Dr. Zuill wished to know how the board of trustees arrived at their conclusion in regard to report as to Dr. Huidekoper's violation of code of ethics. Dr. Kooker read the code of ethics and explained the fact that there was no violation of the code of ethics under the circumstances. Motion being made and seconded that the report, of the trustees, as to Dr. Huidekoper be adopted, it was carried. As to charge against the Clinical Staff of the University, remarks by Dr. Zuill in defense of the staff and by Drs. Sellers, Glass and Hoskins on the question of adopting the report of the trustees were made. Dr. Ridge arguing the point, that the members on the board of managers could not be seperated in the charge from the Clinical Staff. On motion that part of the report of the board of trustees was adopted. On motion the report, as a whole, was adopted.

The following amendment to the Bylaws of the Keystone Medical Association was read and laid over to next meeting. "That any charge as to violation of the Code of Ethics or other charges of a personal nature, against any member of the association shall only be presented in writing, addressed to the secretary of the association, who shall submit the same to the officers and board of trustees of the association, and they shall only be brought before a general meeting of the association and the public, if the officers and board of trustees decide the charge merits further consideration and upon their presentation of the case."

Communication was read from Dr. Webster stating his misfortune and his inability to attend the meetings. Dr. Ridge, a member of the clinical staff presented the following, "moved that the members of the Clinical Staff of the Veterinary Hospital University of Pennsylvania be expelled from this association." Referred to trustees for action.

The bill for three month's rent of room, fifteen dollars was presented, and an order drawn for the amount.

Dr. Sellers read a paper on Pneumonia. In his experience it is a disease attended with little or no danger. Dr. Zuill also agreed with the writer that there was no fatality and very little medication needed. Dr. Kooker recited a case of tetanus when the only cause could be attributed to the dropping of snow water upon the lumber region, followed in a few hours by tetanus in an aggravated form resulting in death in twenty-four hours. Dr.

Hoskins reported a similar case from the same cause. Cases recited by Drs. Eves and Ridge. Adjourned.

W. S. KOOKER, *Secretary*, Pro. Tem.

Alumni Association of the American Veterinary College.

EXECUTIVE COMMITTEE FOR 1891.

RESIDENCE.	CLASS.
Dr. Geo. Bridges (Chairman) South Norwalk, Ct.	'87
Dr. W. A. Engeman, 123 St. John's Place, Brooklyn, N. Y.	'88
Dr. W. B. E. Miller, 532 Penn St., Camden, N. J.	'89
Dr. Jos. Ogle, 302 West 46th St, New York city, N. Y.	'90
Dr. W. L. Labaw, 141 West 54th St., New York city, N. Y.	'90
Dr. M. W. Drake, 312 Reed St., Philadelphia, Pa.	'88
Dr. W. H. Lowe, Paterson, N. J.	'88

RESIDENT STATE SECRETARIES FOR 1891.

RESIDENCE.	CLASS.
California, W. B. Rowland, D. V. S., Pasadena.	'82
Connecticut, A. A. Tuttle, D. V. S., New Britton.	'85
Colorado, A. F. Martin, D. V. S., Denver.	'81
Delaware, H. B. McDowell, D. V. S., Middletown.	'88
Dakota, G. A. Agersborg, D. V. S., Vermilion.	'81
District of Columbia, Alex. McKenzie, D. V. S., Washington.	'86
Florida, E. A. Child, D. V. S., Leesling.	'81
Iona, A. B. Morse, D. V. S., Des Moines.	'83
Indiana, J. J. Shoemaker, D. V. S., Bluffton.	'87
Illinois, J. W. Harmord, D. V. S., Bloomington.	'88
Indian Territory, G. E. Griffin, D. V. S., Fort Reno.	'89
Kansas, D. C. Ayer, D. V. S., 710 Chenter St., Leavenworth.	'89
Kentucky, J. C. Kidd, D. V. S., Lexington.	'87
Massachusetts, J. J. Winchester, D. V. S., Lawrence.	'78
Maryland, Wm. Dougherty, D. V. S., 1035 Cathedral St., Baltimore.	'76
Maine, G. H. Bailey, D. V. S., 1 Pine St., Portland.	'80
Missouri, T. J. Turner, D. V. S., Mexico.	'87
Michigan, W. J. Menhennitt, D. V. S., Champion.	'90
New Hampshire, A. L. Dodge, D. V. S., Manchester.	'85
New Jersey, J. A. Autenreith, D. V. S., 780 W. Newark ave., J. C.	'82
New York, R. E. Buckley, D. V. S., 210 W. 54th St., New York city.	'87
Ohio, W. M. Tritschler, D. V. S., Dayton,	'88
Oklahoma Territory, C. D. MacMurdo, D. V. S.	'89
Pennsylvania, C. T. Goentner, D. V. S., Beyre Manor.	'81
Rhode Island, W. L. Brut, D. V. S., Providence.	'81
Tennessee, J. W. Scheibler, D. V. S., 312 Third St., Memphis.	'85
Utah, S. L. Richards, D. V. S., Salt Lake City.	'85
Vermont, S. C. Waterfield, D. V. S., Montpelier	'87
Virginia, J. A. Myers, D. V. S., Linville.	'83
West Virginia, F. B. Ford, D. V. S., Moorefield	'88
Wisconsin, C. Evans, D. V. S., Racine.	'83
Wyoming, A. A. Holcome, D. V. S., Cheyenne	'76

FOREIGN CORRESPONDING SECRETARIES.

Cuba, H. T. Laine, D. V. S., Havana.	'86
West Indies, F. W. Peniston, D. V. S., Bermuda.	'90
Japan, H. A. Yokura, D. V. S., Koneaba Tokio.	'85
A. T. SELLERS, D. V. S., <i>Secretary.</i>	

Ontario Veterinary Association.—The annual meeting of the Ontario Veterinary Association was held in the Ontario Veterinary College, Toronto, on December 19th, 1890, at 1:15 P.M. In consequence of the absence of the President, Mr. D. McIntosh, the vice-President, Mr. N. Gibb took the chair, and in opening the meeting made a few appropriate remarks, regarding the absence of the President who had written regretting his not being able to attend. The minutes of the last meeting were then read and confirmed. The Secretary's, Treasurer's and Auditor's reports were then read showing the finances of the association to be in a good condition. The Registrar reported two graduates registering at the last meeting and seventeen since the meeting up to date. The following gentlemen were present at the opening of the meeting, several others came in before its close :

Prof. Smith, Messrs. O'Neil, Quinn, Shaw, J. H. Wilson, J. Wende, Lloyd, Gibb, C. Elliott, W. Cowan, McArthur, Hand, Steele, Hawkins, Gallanough, W. G. Wilson, Heslop, Hopkins, Sweetapple.

Mr. Heslop, of Appleby, Ont., and F. J. Gallanough, of Thornhill, were duly proposed and elected members of the association. Mr. Hopkins, of Detroit, was elected an honorary member of the association. On motion of Prof. Smith seconded by Mr. John Wende, Dr. Huidekoper, of Philadelphia, was elected an honorary member of the association. The payment of dues then took place and in the discussion on those in arrears it was moved, seconded, and carried that members three years in arrears shall be struck off the roll. J. D. O'Neil, V. S., London, read the following paper on Soundness.

MR. PRESIDENT AND GENTLEMEN :

The subject matter of my paper which I beg to bring before you this evening is that of Examination of Horses as to Soundness ; a subject of the greatest importance to us as Veterinarians, and to the community of horse-owners at large, and one which during all past years has been the cause of much difference of opinion and contention amongst members of our profession, and some of our most eminent authorities.

To young practitioners about to enter upon their professional career or those who have just entered upon it, the subject is always one of interest, for no other test seems to equal that of examining an animal as to soundness ; under may be critical eyes, to a young man with the prospect of world-famed failure if he does wrong and of no world-famed applause if he diagnoses aright. To older practitioners and those of great experience and so accustomed to conducting examinations as to soundness that it becomes as child play * * * The first thing we must decide amongst ourselves is that, of what is to be defined as unsoundness. I take unsoundness to be "That condition of abnormality of an organ or organs, in any part of the animal structure, which interferes with the proper performance of function

or functions, or at any time may be liable to cause an interference of same, or to cause an unfitness to perform the purpose for which the animal was intended and consequently depreciates and lessens the value of the animal under examination.

Now having decided what unsoundness is ; how are we to find it out ?

D. O'Neil then gave a detailed description of the method of physical examination of the horse, with the diseases, which may effect each part, and continued :

If Veterinary Practitioners will always follow a careful course in their examinations they will make few errors. Now having given my definition of unsoundness and description of my mode of examining for same, we are led up to the question of what really constitutes unsoundness, for, on examination we may find blemishes which deteriorate the animal in appearance but not his usefulness, and in no case could really be called an unsoundness. It is our duty to call our clients to the presence of the same, signifying at the same time their harmlessness.

That which really constitutes unsoundness, I take it as any fault or departure from the healthy state, that will come in under my definition of unsoundness. Many things that we would draw our client's attention to may not debar the animal from a useful and serviceable life, and he may be practically sound for all general purposes. We say he is practically sound and we *do not* reject the animal, the only result being his value may be depreciated for we *must not indiscriminately reject* every animal for any single defect we see upon him. *Many things* have to be taken into consideration, whether it is likely to permanently effect the animal, the sex, age, temperament and nature of the work of the animal. The extent, nature and position of the defect under notice. But where we come across a case of undoubted unsoundness that is likely to be reproduced in other generations, *then must we reject with a firm, hand* for one and all we should endeavor all we can to put a stop to the transmission of hereditary unsoundness, and, gentlemen, this brings us to another field where we have plenty of scope, for in the list of hereditary unsoundness, I would include ophthalmia, cataract, roaring, whistling, ring-bone, side-bone, navicular disease, spavin, curb, grease and shivering, and under some circumstances, bog-spavin, thoroughpin and other tarsal enlargements, as wind galls, splints, weak or contracted feet or stringhalt. So in this formidable list we have plenty of room to exercise our powers upon and I doubt not that many differ upon it now. In like manner as in the past it has always been a bone of contention. I have merely brought before your notice a few of my thoughts in as brief and practical a manner as possible, written with a willing hand in spare moment's by a working practitioner.

Mr. John Wende read a paper on Prolapsus in the bitch.

Hysterorrhaphy, or Ventral Fixation of the Uterus, For the cure of inversion of that organ in the bitch.

On October 24, 1890 I was called to attend a Newfoundland bitch, eleven months old, said to have a large swelling under her tail. Upon examination I found the uterus inverted, the tumor being about the size of two fists, covered with pus and emitting an offensive odor. The hairs of the tail and hind leg's were matted together, making the animal a very loathsome object.

The owner told me that the bitch had come into heat about three weeks previous, and she, being young, and never having been bred before, he decided not to stint her to a dog until the latter part of the oestrus. On the sixth or seventh day he noticed her straining, and also the appearance of the tumor in the vulva. She continued her expulsive efforts, and in twenty-four hours the protruding organ had increased to the size of a man's fist. He then consulted an Empiric, who prescribed a powder to be given internally, and the parts to be swabbed with equal parts of warm water and milk several times daily. He also cautioned the owner not to touch the organ with his hands, as it might produce "blood poisoning" to both animal and man.

After employing the prescribed treatment for two weeks, during which time the dog assumed the appearance above described, the owner was advised to consult me. I had her brought to my infirmary, and with the assistance of my student, R. H. McMullen, washed the parts thoroughly, placed her on a table under the influence of ether, removed all scabs, and by continued pressure for one hour, succeeded in returning the protruding viscus to its natural position. We then stitched up the vulva with four interrupted stitches of linen tape, fed the patient on a laxative diet, and washed the parts twice daily, using a syringe and antiseptic and astringent lotions, composed of water, boracic acid, alum and sulphate of zinc alternately. This treatment was continued for one week without any apparent improvement, as the organ persisted in resting against the stitches in the vulva, even if it were placed into position with a pessary a dozen times daily.

I then decided on the above named operation, which has been successfully performed on human subjects, for the details of which I would refer the reader to two articles by Howard Kelly, of Philadelphia. The first in *the American Journal of Obstetrics*, Vol. XX., Jan. 1887, and the second in *the American Journal of the Medical Sciences*, May 1888. Also to one by Sanger on *Operative Treatment of Retroversio-flexio Uteri*, in the *Centralblatt für Gynäcologie*, Nos. 2 and 3, 1888. It was as follows: Again placed the bitch on the table under ether, shaved the hair from the posterior part of the abdomen, made an incision about five inches long on the linea alba between the last four teats, passed my hand into the abdomen, grasped the uterus, and by gentle traction drew it forward into position, and fastened it about one inch above the incision with three interrupted stitches of heavy catgut. In inserting the needle I aimed to grasp about one-third of the body of the uterus, and quite deeply into the muscles of the abdominal wall. I then sponged out the abdomen with a weak solution of boracic acid, sutured the muscles with catgut, the common integument with linen thread, removed the stitches from the vulva, the muzzle from the nose, dashed a little cold water on the head and chest of the patient, and in a few moments she stood up apparently none the worse from the effects of the ordeal. On Nov. 6, seven days after the operation I removed the stitches from the skin and sent the bitch home all right, with the exception of the wound on the abdomen, which was about three inches long, and that she evinced pain whenever she tried to sit down upon her haunches for three weeks after the operation. But this trouble has gradually worn off, and at present she is as well as ever.

It was moved by Mr. Wilson, seconded by Prof. Smith and carried that the thanks of the meeting be presented to the readers of papers. And the Secretary was instructed to forward them to the JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES, and to the Veterinary Journal of London England.

Dr. Duncan mentioned instances of nodules on the mesentery produced by parasitic worms.

Mr. Hawkins described some cases of furunculus or gangrene, in Detroit, and cases of the same, were mentioned as having occurred in Toronto, Buffalo, and some other cities. Mr. Gibb mentioned that the disease had occurred in Boston in 1857 and had been there treated with pyroligneous acid.

Dr. Duncan suggested that the sloughing might have been produced by lowered vitality similar to that produced by ergot, but in these cases produced by cold.

Prof. Smith suggested that cold and slush, perhaps salt on snow or ice, sometimes put on to keep the tracks of street cars clear, may possibly produce it, but he believed it due to some local poison probably a micro organism, and he advocated the use of strong antiseptics, such as carbolic acid, he did not recommend poulticing.

It was moved, seconded and carried that the Secretary should procure some more copies of the tariff and also get out a printed list of the Registered graduates.

Mr. Gibb vacated the chair and Mr. Cowan presided.

The election of officers then took place with the following result:—

Mr. W. Gibb, St. Mary's, President; Mr. D. McArthur, Ailsa Craig, First vice-President; Mr. J. Wende, Buffalo, N. Y., V. S., Second vice-President; Mr. C. N. Sweetapple, Toronto, Secretary; Mr. W. Cowan, Galt, Treasurer; Messrs. O'Neil and Elliott, Auditors; Messrs. Burns, Hand, W. H. Wilson, Steele, Gallanough, Hopkins, Ormsby and Lloyd, Directors.

Messrs. J. H. Wilson and O'Neil, Delegates to Western Fair Association

Mr. W. Cowan, Delegate to Central Permanent Farmers' Institute.

Prof. Smith was elected Honorary President.

Mr. Hawkins spoke in disapproval of qualified practitioners associating themselves in business with empirics. He also mentioned that many prominent positions were occupied in the United States by Graduates of the Ontario Veterinary College, and was greatly in favor of the Summer practice which is required of all students who attend this college.

It was moved seconded and carried, that the sum of \$25.00 be appropriated for a medal to be competed for by the students of the Ontario Veterinary College, at the approaching Spring examinations. The usual fee of \$50.00 was then voted to the secretary for his services.

Dr. Duncan remarked that Prof. Axe disapproved of the operation in consequence of the severity of the cough that supervened. Prof. Smith said that the general opinion amongst veterinary surgeons in Great Britain was not in favor of the operation. But that it might perhaps be beneficial in some cases for slow work.

At the close of this discussion the meeting adjourned.

C. M. SWEETAPPLE, *Secretary.*

THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES.

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MARCH, 1891.

No. 3.

HYPOSULPHITE OF SODA.*

By E. H. SHEPHERD, V. S.

We have an agent classed among our veterinary remedies whose virtues are not appreciated as perhaps they should be. Some simple remedies prove to be a power in the hands of some, while with others they seem to possess no curative virtues at all.

It is undoubtedly a fact that the actions of many drugs are modified, not only by different organisms, but by different climates and different surroundings and especially so when combined with other agents. It is my endeavor to-day to bring before you and, if possible, impress upon your minds some, at least, of the virtues I have found to be possessed by this cheap and efficient remedy namely "The Hyposulphite of Soda." This preparation is formed by boiling the filtered solution of Sulphite of Soda with Sulphur when after filtration and concentration the crystals are deposited in colorless transparent prisms or plates. It is odorless and has a cooling and somewhat bitter taste, is neutral or faintly alkaline in reaction and is soluble in 1.5 parts of water. Its main action is as an antiseptic but it is also a strong deodorizer, alterative and insecticide.

In the stomach it gives off sulphurous acid which, from its preparation, it resembles. It destroys bacteria and septic germs, arrests fermentations and removes offensive smells. It is much used in photography and forms an important part in some official tests.

* Read before the Ohio State Veterinary Medical Association:—

Among the first cases in which I used this salt with marked success was in the treatment of a valuable stallion, but recently brought from California and not yet acclimated.

Soon after arrival many parts of the body especially those covered by the harness, became covered by eruptions, and by their intense itching caused the animal to rub and produce a raw surface, and he could with difficulty be prevented from irritating it still more; a peculiar black discharge issued from the anus continuously and trickled down the thighs, and so on to the ground; his tail had become full of it and seemed from its tarry consistency to defy thorough cleansing; a peculiarly bad odor accompanied the discharges. His appetite was capricious.

His food and surroundings were of the cleanest and best, and the general attention bestowed upon him was befitting a \$10,000 stallion. After thorough examination I put him on Hyposulphite of Soda, $\frac{3}{4}$ ss. doses, three times a day with a very small quantity of gentian; eighteen powders, six days treatment, sufficed to cleanse and cool his blood, entirely allaying the skin irritation and regulate the bowel secretions to almost perfection.

In one year from that time he had a slight similar discharge from the bowels which was entirely overcome by one-half dozen powders of the same preparation.

During the past summer I have treated skin troubles whether dependent upon constitutional or local causes, almost entirely with this preparation of soda, and with universal good success. One case deserves mention especially.

A young pacing horse with considerable speed had been fed pretty high, to fit him for a good showing at the Fall sales at which he was entered. Unfortunately without much regular exercise he was given a long drive on a hot day. And the next morning I was called and found him one mass of pimples from the tips of his ears to his hoofs. In a few days he was as hairless as a Mexican dog, the skin scaling off and leaving an irritable itchy surface, which he rubbed and bit and actually tore with his teeth at every opportunity.

Solutions of Hyposulphite were applied externally and following a physic $\frac{3}{4}$ j dose four times a day given internally. Other preparations were used for a day at a time externally, but none seemed to allay the irritation as well as the soda. With a cooling diet and an occasional stimulant for the kidneys, thirty days found him again on the road in fair flesh, good spirits and covered with a short, thick glossy coat.

Other cases of eruptions of less consequence—some affecting the larger part of the body, others only local have been successfully combatted and the animal kept at his work.

In speaking of this medicine Finlay Dun, in his excellent work, gives several interesting experiments, showing its power as a poison to fungi and other low organic forms, and many have been made mostly as recorded with the sulphite, showing its power to control septic conditions.

Dogs previously prepared for several days with small doses of Hyposulphite, have withstood injections of foetid pus, and even survived the injection of the purulent discharge from a glandered horse.

It is in the treatment of Septicæmia and all putrid conditions of the system that I think this agent deserves a thorough trial. About one year ago I was called to see a promising colt, the right side of whose face was terribly swollen, from eight or ten openings issued a foetid putrid discharge, somewhat dark in color and mixed with streaks of blood. The skin seemed to a large extent to be underrun and I had to open several pockets to get a drainage.

There were several openings into the mouth and the animal could scarcely eat even soft food. On his back just forward of the hip on the right side was a large swelling discharging from its one opening a fluid identical to all appearances with the other.

The pulse 82 and wiry, temperature $104\frac{1}{2}$. I concluded that here we had a serious case, but could not give the direct cause, unless it originated with the teeth, which were quite sharp opposite the internal openings. I dressed the teeth and thoroughly cleansed the abscesses, using a Bichloride solution, 1 to 1,000. And left a solution for future injection of 1 to 5,000. I administered ℥j of Hyposulphite of Soda and left instructions that he should get ℥ss . every four hours in solution.

I saw my patient again in two days, pulse 60, temperature 103, eating more and feeling apparently better. The abscesses showed a more healthy discharge and were not inclined to spread. I continued the medicine for some days reducing it in quantity. My patient made a rapid recovery.

The owner of the colt is one of the leading physicians of Cleveland, and he took occasion soon after to call my attention more particularly to this remedy which was entirely new to him. Two weeks ago I had a long talk with him again and he was very enthusiastic over his success with it saying, "It had worked like a charm in every case." And he proceeded to call my attention to

numerous cures he had effected with it, one or two of which are particularly worthy of mention.

From a scratch, or small injury a young man's hand and arm had become swollen almost out of resemblance to its original shape, the line of lymphatics to the shoulder were terribly enlarged and the hand and lower arm had assumed a leadened hue, which with the constitutional symptoms presented, but fair that an amputation of it might soon be necessary to save his life. However, it was resolved to use the Hyposulphite and note its effect if any, gr. xv. were administered every four hours and by the following day, a perceptible change for the better could be seen, and on the second day considerable hope was given that the arm would be saved. The fourth found him to all appearances out of danger, and he rapidly made a complete recovery.

Another, still more serious, was the case of a man whose foot had been crushed down at the instep, by the wheel of a heavy wagon, and in hopes of saving it amputation had been delayed until, almost before they realized the fact, it had become putrid. The limb was terribly swollen and pressure upon it even as high as the thigh would cause a fœtid discharge to issue from the opening below. After amputating just above the ankle, two large pus cavities were tapped above the knee and three below to get sufficient drainage for the purulent matter that was fast accumulating. Everyone who saw it thought there was little chance for the remainder of the leg or the patient's life, as he was much wasted and very weak. However, my friend, who was called in consultation, persuaded them to rely on the soda, which they did with very gratifying results, saving the patient's life and the remainder of the leg. In numerous cases of wounds large and small, where there was much discharge, I have used this agent and cannot compute the good it has done me. In the results of a runaway accident one horse had a wagon tongue thrust into his neck just beneath the third cervical, passing through to the skin of the opposite side and in his efforts to escape, muscles, trachea, œsophagus, arteries, and veins were stripped of their attachments and hung dangling like so many sections of slack-rope, one wing of the atlas was fractured and a large pocket opened below along the lower surface of the vertebra and behind the inferior cervical muscles. The depression of the head partially drained the several large pockets, and this case was treated successfully in a short time, by local applications of Bichloride and white solutions, and the Hyposulphite internally, there was scarcely any fœter at any time.

I could call your attention to other cases just as gratifying to me, but I wish to name another condition for which I have found my subject beneficial.

In the treatment of gastric and bowel troubles associated with fermentations, we find different gases generated in various proportions, according to the cause, time elapsed, and surrounding conditions. In cases apparently similar, I have found it necessary to use entirely different agents to gain my desired result. In the use of the Hyposulphite for these conditions I believe it to have been an essential adjunct in every case. Associated with the process of fermentation and the formation of gases there is always absorption to a greater or less extent of these poisonous products into the blood, and in many cases this is the sole cause of death. In the Hyposulphite we have one of the greatest antiseptics and blood purifiers. Thus, acting at the same time, to prevent absorption and to destroy the already absorbed, while striking directly at the cause, it is very effective in arresting the fermentation.

And again, in azoturia, although my experience is here limited, I am becoming more and more convinced, that it is most worthy of a thorough trial. Undoubtedly the whole line of symptoms in this disease is caused by the actions of poisonous products upon the nerves and their centers. Thus, directly through the condition of the blood, we are sure to get our several results.

Urea, is one of the natural constituents of urine excreted from the blood by the kidneys. In this disease immense quantities of it are excreted, showing an unnatural action of the kidneys or an inestimable quantity of it in the blood, which from its nitrogenous character is without doubt.

The Hyposulphite of Soda, acts directly to diminish urea and increase uric acid, the sulphates, sugar and other non-nitrogenous constituents, a condition certainly necessary to the recovery of the patient.

I have used it in several cases all of which have recovered. Two of the number were prostrated and could not rise and one that was placed in slings could not bear any weight on one hind leg for five days. Although standing his urine had to be drawn during the first three days. Considering the scarcity of my patients that have lived after being prostrated with azoturia and subjected to my previous treatment, I feel that my new departure deserves further trial which I shall certainly give it at my first opportunity.

I wish once more to trespass upon your patience, by drawing again from my memoranda of experience. Two cases of abortion—the first occurring about one week before I was called—was informed the animal appeared well for two or three days then began to be uneasy, ate little and gradually grew worse until at the present she ate nothing, was continually uneasy; respiration 36, pulse 80, temperature 105° ; a foetid discharge issued from the vulva and the abdomen had a tucked-up appearance, she strained at short intervals passing a colored discharge.

I found the vagina and uterus much swollen, the latter containing a small quantity of putrid matter. I cleansed the parts as thoroughly as I could although the effort caused much irritation. And being a little afraid to risk the Hyposulphite alone, I combined with it fair sized doses of aconite; after two or three days of uncertainty she began to make a slow recovery which proved permanent.

The other, not as serious as I would have liked, I was called to attend within an hour after her untimely delivery, found her not much changed from the normal in pulse and temperature, inclined to eat, yet a little uneasy, and to all appearances the abortion was a complete one, I gave her a light opiate and waited developments. The next day she was more uneasy, lying down considerably, eating little, respiration 24, pulse 72, temperature $104\frac{1}{2}$ and quite a profuse discharge from the vulva. I attended to her general comfort more especially, left instructions in regard to diet, administered $\frac{3}{j}$ of Hyposulphite in solution, and left similar doses to be given every four hours.

The next day, respiration 16, pulse 48, temperature 103° . The third day, respiration 14, pulse 36, temperature 100° . Complete recovery followed.

In conclusion, my experience with this agent has been highly satisfactory to me, and I could name many more cases where I attribute the sole cause of recovery to it. Let me urge all who have not given it a thorough trial to do so, and from those to whom it is familiar, I should be pleased to hear the results of their experiments.

THE GERM OF TEXAS FEVER.
CAN IT BE CULTIVATED FROM THE ORGANS OF
SOUTHERN CATTLE?

BY R. R. DINWIDDIE, VETERINARIAN.
Arkansas Agricultural Experiment Station.

During the past summer I have devoted my time to experimental studies of the blood and viscera of cattle, living within the regions of the South permanently infected with the virus of Texas Fever, and herewith briefly present the results of this portion of my work as a contribution to the literature of the subject. My object has been the determination of this question:—Do cattle from the South, infection bearing cattle, contain the agent of infection, in their *systems*, as distinct from the intestinal tract or any external medium in which the virus may be conveyed?

I have assumed, for the purposes of this work, that the causative agent of Texas Fever is a Schizophyte capable of cultivation or demonstration by the usual methods of bacterial investigation.

Those who have acquainted themselves with the reports of recent researches on Texan Fever will recognize the basis for this assumption as well as the reason for looking for the germ in this situation.

Bacteriologists now admit that the living tissues of the healthy animals do not, except in rare instances, contain bacterial germs. If then, as has been asserted and very widely accepted, there is constantly present in the liver, spleen, kidneys and blood of native Southern cattle any bacterial organism, we have good grounds for inferring this to be the much sought-for germ of Texas Fever, and this would be the most suitable place for obtaining it in pure cultivations.

My investigations were carried on at Little Rock, Arkansas, which with the surrounding country is infected territory. Cattle shipped there from the North die of Texas Fever to the extent of at least sixty per cent. The material was obtained at the slaughter houses of that city from cattle raised in the vicinity or coming from points further south.

In order to determine the presence of bacteria in tissues or in fluids, two methods are available ; these are microscopic examina-

tion of the material and inoculation of culture media in sterile tubes. It is possible that bacteria may be present even if both of these methods fail to give positive results and hence negative evidence in bacteriology is evidence only and not proof, but, on the other hand, until their presence has been so proved we are not justified in assuming their existence, however well such assumption may harmonize with our preconceived theories. My methods of work are such as are employed in modern bacterial research. The culture media employed were beef-infusion peptone, nutrient agar, glycerine agar, milk, and cooked potato all contained in test tubes of varying sizes. Inoculations were made by means of the platinum wire, with the usual precautions necessary to prevent contamination, and conducted both in the slaughterhouse and in the laboratory. In the former case the material was used within half an hour after death, immediately after death in the case of the fluids.

Material for use in the laboratory was wrapped in cloths saturated in sublimate solution, or conveyed in sterile sealed pipettes, and examinations and inoculations of tubes made from same as early as possible, generally within three hours after death.

In all, during the summer, I made in this manner eight series of inoculations from as many animals. In each series a large number of tubes were employed, generally forty to sixty, in order to diminish the risk of forming conclusions erroneous owing to accidental contaminations. A certain number of tubes were kept in the thermostadt at 35° C., the remainder at ordinary room temperature in summer.

The result of these investigations force me to come to conclusions at variance with others who have preceded me in this field of work.

With one exception which I shall presently refer to, the blood, liver and spleen of these cattle failed to give rise to any growth when transferred by the needle to culture media of any kind.

I have frequently, by means of the looped wire, transferred to beef infusion tubes sufficient blood to distinctly tinge the fluid, which nevertheless remained otherwise clear after two or three weeks in the incubator.

Spleen pulp was also in all cases sterile. Inoculations from the bile were not always followed by results admitting of such ready interpretations. In the majority of cases tubes sowed from this source gave rise to no growth but in others I did obtain cultures of micro-cocci. Whether these growths in all cases came

actually from the bile or were contaminations I cannot at this time positively affirm. Some cultures from this source were manifestly mixed. I am inclined to think that the bile in the gall-bladder of cattle at least is usually free from germs but may at times contain diverse organisms by migration or growth of the latter from the intestinal canal.

The exceptional case referred to above was the first animal from which cultures were attempted. In seventy-five per cent. of tubes inoculated from the liver of this case growths were obtained of a micro-coccus. These growths occurred alike in tubes inoculated in the slaughter-house and in the laboratory, and I have little doubt but that they really had their source from germs contained in the liver, although that organ appeared to be in a normal condition. None of the other materials made use of in this animal gave rise to growths except the bile which gave a mixed culture of the same micro-coccus along with another of somewhat similar microscopic appearance but differing in its growth on the various media.

The organism derived from the liver occurred in pairs and in short chains of not more than four or five elements. It is refragent, exhibits active molecular motion in fluids, and is readily stained. Diameter 1.6 μ . It grows readily on all media employed, at room temperature and in thermostadt. In beef infusion it clouds the fluid in twenty-four hours, the opacity extending in streaks downwards; a sediment soon forms; there is no surface pellicle.

On agar the growth is pure white, raised and limited, with smooth surface and margins. It does not spread over the surface. Gelatine is not fluidified.

I do not further enlarge on the biology of this germ as I consider it to have no pathogenic significance. It was never encountered again in the organs of cattle, but later I did succeed in isolating apparently the same form from water of the range on which these cattle grazed. Sometime later the opportunity occurred of testing its effects on animals. Inoculation and feeding experiments on calves and guinea-pigs gave negative results. I therefore conclude that the liver of cattle may occasionally harbor, perhaps temporarily and in greater or less quantity, one or more species of bacterial organisms derived from the food or water, without producing any deleterious effects.

Such is the result of my culture experiments. Briefly, I may add that microscopic examination of the same materials have not

enabled me to confirm the results of others who have found bacteria in similar situations. Neither in smear cover-cover glass preparations nor in sections from organs of Southern cattle have I been able by any method of staining to demonstrate the presence of bacteria to my own satisfaction.

As every established fact bearing on the etiology of Texas Fever has its importance I will advance this as the result of my investigations, and in answer to the question which forms the title for this paper, namely :

That healthy Southern cattle raised on infected pastures do not regularly bear in their tissues, blood or viscera any bacterial organism capable of demonstration by ordinary microscopical methods, or of growth on the ordinary culture media employed in bacterial research.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VETERINARIAN.

[Continued from page 83.]

IRREGULARITIES OF THE DENTAL SYSTEM.

The dental system offers a large number of very interesting and important irregularities. When these exist the horse is said to have an irregular mouth, or to be falsely marked. Some of the irregularities are without importance, while others may influence the wearing of the teeth to such a degree as to make the determination of age somewhat difficult, except by a careful study of all the changes.

The irregularities can be classified as follows :

1st, Number—augmentation and diminution. 2nd, Form of the incisors. 3rd, Uniting of two incisors. 4th, The form of the cup, fissure of the dental cups. 5th, Depth of the dental cup and size of its cavity (begue). 6th, Fault of length, or excess of size of one of the jaws, prognathism, brachy-gnathism, excess of length of the superior incisive arch. 7th, Excess or fault of use. 8th, Marks produced by cribbing. 9th, Fraudulent alterations, removal of the milk teeth, bishoping, filing the corners.

IRREGULARITIES IN NUMBER.—AUGMENTATION.

Incisors :—The most curious example of this anomaly is one which was noted for the first time by Lafosse, 1772. He states

that he found horses with the double rows of incisive teeth. This anomaly was again noted by Goubaux, in 1842. His case had two rows of incisors of second dentition in each jaw, making twenty-four in all.

Augmentation or duplication of the incisors of second dentition for one or two pairs of teeth are not rare. The accompanying plate gives an excellent example. In figure 56, there are two

FIG. 56.

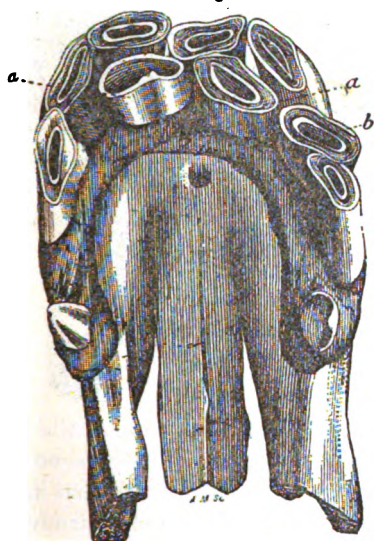
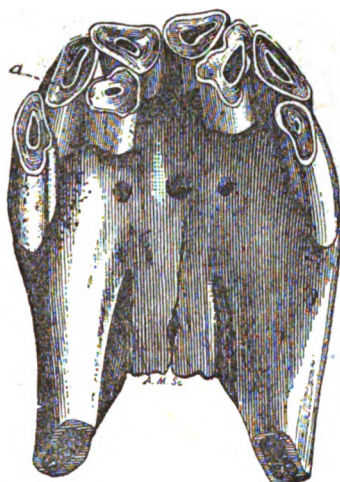


FIG. 57.



supernumerary pinchers *aa*, and one supernumerary intermediate tooth *b*. Figure 57, shows two supernumerary intermediate teeth *a* and *b*. Figure 58, has an intermediate tooth *a*, directed transversely and held in place below the incisive foramen by a bony bridge.

FIG. 58.

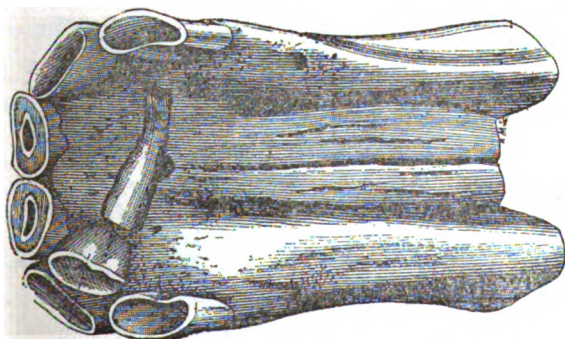


Figure 59, shows a pincher tooth similarly deflected. All these teeth are of second dentition.

FIG. 59.

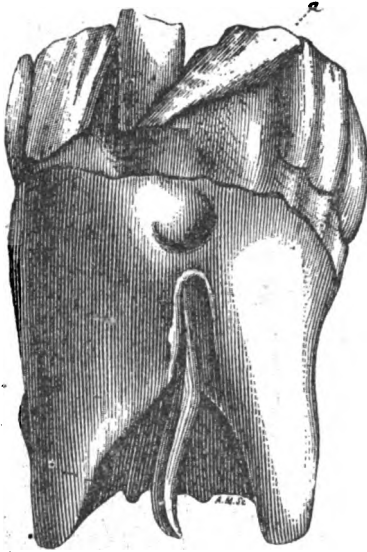
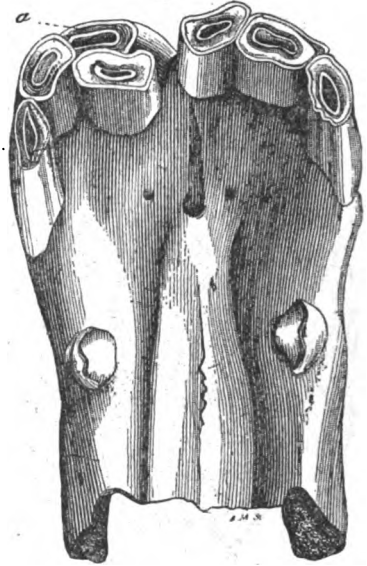


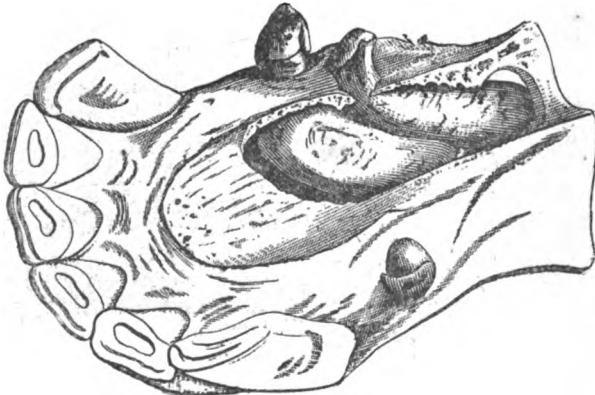
FIG. 59 a.



Supernumerary teeth of the lower jaw are less common than in the upper one; they sometimes however, occur. The presence of supernumerary teeth rarely modifies the wearing of the others in the marking of age. Supernumerary teeth are usually firmly held in their alveolar cavities and rarely alter the shape of the arch of the incisors, except when milk teeth are still remaining, with which they should not be confounded.

Tush Teeth.—Goubaux reports a case of an ass with supernumerary tush teeth which seems unique, Fig. 60.

FIG. 60.



Molars.—Supernumerary molars have only been found in the upper jaw. They occur sometimes in line in the normal arch, at other times protrude to the outer side, in which case they may cause trouble by wounding the cheek. They have also been found under the zygomatic process at the base of the ear, where they may cause an abscess which opens on the exterior, or have been known to protrude into the cranium.

Diminution.—Diminution in the number of the incisors is less frequent than the presence of supernumerary teeth. Diminution should not be confounded with cases of tardy eruption, nor with those cases of arrest of development, in which the teeth remain in their alveolar cavities, nor with cases of fracture or surgical injuries, and loss of teeth. Diminution includes only the complete abortion of the dental follicles, and can sometimes only be determined by examination of the jaw after death. Incisors, tush or molar teeth may be absent.

The tush tooth is the one which is most frequently absent.

[TO BE CONTINUED.]

ANIMAL INTELLIGENCE.*

BY H. VULLIAMY.

VETERINARY STUDENT, ONTARIO VETERINARY COLLEGE.

In considering the intelligence of animals it would be well first to thoroughly understand the difference between instinct and reason.

To explain this in as few words as possible I would say that an action performed for the purpose of gaining the object it attains, is directed by reason. An action having for its object, the satisfying of some inward desire, and not for the purpose of accomplishing the object it ultimately attains, is the result of instinct. To make this still plainer, we will take for example an action with which we are all familiar, namely, eating. We, as a rule, eat, to satisfy a craving we have and not to support life ; therefore we eat instinctively.

The chief object of this essay, is to show the difference between the mental capacity of man and that of the domestic animals.

*Paper read at a meeting of Veterinary Society, Ontario Veterinary College, Toronto, February 3, 1891.

Dr. Sexton, who has given this subject a great deal of thought, claims for men four instinctive and three reasoning powers which animals do not possess. I use the term animal, as distinguished from human. The first instinctive power which man alone possesses is, "A knowledge that there is a Supreme Being." No one would dispute the fact that animals have no such instinct. Its existence in humanity however, might be questioned by some ; but history shows us plainly that every nation or race of people, worshiped a Supreme Power in some form. Instinct told them that there was a something more powerful than they, and which was able to control them. Some connected it with the heavens, others with animals, and so on. To-day there are men in civilization who would wish to think otherwise ; but their very perseverance in endeavoring to find argument to extinguish this instinct, proves its existence and the fallacy of their theories. The second instinctive power to be mentioned is this, "An instinctive fear of death." The opinion may be held by some that animals do fear death, yet if one hundred animals were placed in a row and killed, one by one, in such a way that no blood was shed and no pain was shown, the hundredth animal would be no more frightened than the first. Animals fear blood, and are angered or frightened when they see another in pain ; but knowing nothing of the future, they are unable to fear that which is ahead, and cannot realize the process of death.

The third instinct to be spoken of is, "An instinctive fear of punishment when a wrong is committed." The proverbial "guilty conscience" we possess cannot be gainsayed, for we have all experienced it more or less. It might be claimed by some people that animals also possess this instinct. Fear of punishment may be connected with a certain action ; but the animal does not feel that the action is wrong in itself, until punished for it.

Lastly, "Man has an instinctive desire to see justice done." However bad a man may be, if he hears of an injustice committed to another, instinctively he sides with the aggrieved. Among the brute creation we find the reverse taking place, for instance, the leading animal in a herd never excites indignation by his brutality.

We now arrive at the reasoning powers possessed only by humanity. In discussing the intelligence of animals, many persons, at the outset, would question the propriety of the term.

Man has so long arrogated the exclusive possession of a mind, or at least of a mind capable of rational reflection, that he is reluct-

ant to concede the fact of its possession by the lower order of animal life. Those acts, which in the brute creation seem to proceed from the action of a power analogous to human intelligence, it has been usual to ascribe to this irrational faculty called instinct, a power, unvariable and despotic in its actions, but in no degree the result of reflection, some metaphysicians going so far as to assert, that the actions of animals are purely automatic, the difference, in this respect, between them and the automation moved by springs, being, that the power possesses a consciousness of their acts which the latter does not. Facts in myriads exist which challenge the correctness of such a theory and point to the existence, at least, in its embryonic condition, of a mind, capable of thought, and to a limited degree, of reflection and comparison, with the ability to deduce conclusions from the facts it considers. This intelligence varies greatly in different animal races, in some species being scarcely perceptible, while in others it is too conspicuous to be ignored. It is the absence of the power of speech in animals which leaves us in doubt as to the exact degree of intelligence possessed by them.

If when a farmer says to his dog: Carlo! the cows are in the grain. Turn them out! the dog should turn his head and say, "Yes sir, I will have them out in a moment," there would be no doubt of the intelligent interchange of thought. But the fact of his carrying out the order, which in the supposed case he would express, proves as conclusively his comprehension and his purpose to obey. The horse or dog, however fully he may understand the directions he receives, can give no other response than by his acts, and to words of praise or censure he can reply only by signs; these are already understood by us and show that our meaning is comprehended by the animal, thus proving a real interchange of thought. To test the existence and extent of intelligence, we must determine the capacity for comprehending thought. We recognize this capacity in a child long before it can express itself in language. Its dawn is seen as the infant learns to associate certain articulate sounds with certain persons, acts or things, to distinguish the meaning of tones which encourage, restrain, or chide it. It is only after twelve months or more of constant tuition, lovingly and intelligently given, that children begin to express in language the thoughts which are awakened by acts, yet the comprehension is as evident, the response as apparent, the whole mental process being in action long before.

The same test which proves the intelligence in a child

demonstrates its existence in animals. There is a similar power of comprehending the wishes expressed, by associating certain articulate sounds with certain acts required, as well as an equal recognition of the tones of voice, by which, approval, reproof or anger are made known ; but lacking the organs of speech they are debarred and ever must be, from any, except the most limited interchange of thought. For this reason, attentive study is needed in ascertaining the extent to which they comprehend and respond to the intelligence which addresses them.

In domesticated animals, especially those which are trained for the use of man, the action of intelligence may be clearly traced ; it is demonstrated by the ease and certainty by which they can be educated. It is seen in the readiness with which many receive and act upon ideas communicated to them ; and in a multitude of instances, the mental process is evident, by which they have independently reached conclusions, rationally deduced from facts of their previous knowledge.

A circumstance is related of a terrier, who had been temporarily left by his master in the care of a Mr. Langford, of St Albans, England. The lady owned a large house dog, which, disliking the presence of the stranger quarreled with him, biting and severely wounding him, after which the terrier disappeared ; but in a few days he returned accompanied by a powerful mastiff, when both together fell upon the original assailant, whom they nearly killed. The mastiff was a watch-dog in his master's house, more than a day's journey distant, and had been brought by the terrier for the sole purpose of avenging the injury he had received, after which they left in company and proceeded together to their home.

Here was displayed a power of combining ideas and communicating them to one of his kind, when the two acted upon the plan they had preconcerted.

The elephant, though one of the clumsiest of animals, exhibits marks of high intelligence and evidently understands the language in which he is addressed. He can be stimulated to wonderful exertion by promise of a reward.

I have seen, says a French writer, two occupied in beating down a wall which their keeper had desired them to do and encouraged them by a promise of fruits and brandy.

They were left alone and continued at their work until it was accomplished. "When a reward is promised to an elephant," says the same writer, "it is dangerous to disappoint him, as he

never fails to avenge the insult." Nothing of this could occur without an understanding of the language.

It may be said that the tones of the voice, rather than the words, are what the animal understands, yet a dog knows his name however spoken and a horse understands a whole vocabulary of orders. But the intelligence which comprehends the meaning of a tone, is not less, than that required to understand a word or sentence.

Having discussed the existence of intelligence in the brute creation, it is now necessary to compare the mental capacity of man and beast. The three faculties which man possesses and which animals are totally devoid of, are: First, "the power of planning for the future." With the animal the affairs of the moment alone engrosses the mind. Secondly, "Man is able to imagine, animals cannot."

To build castles in the air is an ability man alone possesses. Though dreams of the past may disturb the slumbers of the brute creation, they can never have dreams of the future dashed to the ground. They live entirely in the present! Thirdly, "Animals cannot deal with anything in the abstract." An abstract idea in methaphysics, is an idea separated from a complex object, or from other ideas which naturally accompany it, for instance, an animal could not consider the solidity of a stone, apart from the color and shape.

Of these mental faculties animals are totally devoid. Man possesses the other reasoning powers more fully developed; but in animals they undoubtedly exist, in a greater or less degree, good training in some cases showing them to great advantage.

The systems of Pratt, Rockwell and others, have done a great deal to raise the standard of the equine race, teaching, as they do, that horses require to be educated and not tamed. The good results of these methods are seen every day.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the Pennsylvania State Veterinary Medical Association. will be held on Tuesday, March 3, 1891, at the College of Physicians, 13th and Locust Streets, Philadelphia.

The meeting will be called to order at ten o'clock A. M. A full attendance from all sections of the State is expected as in addition to the technical papers which will be presented, the important subject of amendment of the Act Regulating Veterinary Practice will be discussed.

LEUKAEMIA.*

BY DR. GEORGE G. VANDEVEER.

The earliest investigations as to the nature of this disease are those of Bennett and Virchow which were published in the Autumn of 1845. Bennett supposed that the altered condition of the blood was due to the presence of pus and it was not until six years later, 1851, that he abandoned his theory and gave the name leucocythaemia to the disease.

Virchow's researches led him from the first to assign the cause of this white blood to leucocytes. Two years later he published an article in which he considered the conditions under which there might be an increase of the white cells, and their relation to the spleen, and also proposed the name leukaemia.

In 1853 Virchow separated two forms, splenic and lymphatic, and in 1869 Neumann discovered a myelogenous form.

Leukaemia is characterized by a great and persistent increase in the white blood corpuscles, together with a simultaneous decrease in the red cells, but it is unknown whether this relation is due to an arrest of the transformation of white into red cells, or to an increased supply of white cells, or whether both of these causes act together.

Little is known as to the causes of the disease, but all the factors which tend to produce primary diseases in spleen, lymphatic glands and bone-marrow should be considered. As to climate, more cases have been reported in temperate regions than in the tropics.

It attacks all ages, but males are more prone to its ravages than females in the proportion of at least 3-1. It is more common among the poorly housed and fed, than among those who enjoy better sanitary surroundings.

Previously existing diseases may have an effect in producing the disorders prominent among which is mentioned malaria, while pre-existing haemorrhages, and injuries from blows and strains are frequent in the histories of cases.

There is extreme wasting often, oedema is common, and ascites may be present.

The full amount of blood in the heart and blood vessels

*Paper read before the Long Island Veterinary Society Jan. 21, 1891.

usually in the form of large clots is a noteworthy feature, and the collections of white cells densely infiltrating these clots, present a pus-like appearance.

In the majority of cases the spleen is hypertrophied; the splenic tumor is always of considerable size, and generally retains its normal form, developing proportionally in all its dimensions. It is usually bluish-red in color, and may be united to the abdominal-wall diaphragm or stomach by strong adhesions. The capsule is thickened and the vessels enlarged. The organ is hard and firm and cuts with resistance, and grayish-white granular tumors may occur throughout its whole extent, either scattered about or arranged in rows. In the early stages there is swelling of the pulp, and increase in the cell elements without the firmness and hardness of the fully developed leukaemic organ, and at this period rupture may occur.

Uncomplicated cases of the lymphatic form are rare, usually the lymphatics enlarge with the spleen, and in the majority of instances the hypertrophy is not extensive. The process seems, just as in the spleen, to begin with a greater flow of blood, and an increased vascularization, under the influence of which the multiplication of glandular elements takes place. The groups of axillary, mesenteric and inguinal glands are the most frequently affected, they are moderately soft, movable and isolated; in chronic cases they may become very indurated.

The bone-marrow is usually the seat of important changes; both in the central cavity of the long bones and in the cancellated structure of the ribs, the sternum and the vertebræ, the marrow has the same greenish-yellow, purulent color, and the same consistency as mucus pus. Under the microscope it may be seen that cellular elements of the same nature as those occurring in leukaemic blood, form the principal constituents.

The liver is very commonly enlarged, it is pale, smooth and retains its shape. The substance is usually firm, of a grayish-brown color or may be marbled. Two chief changes have been met with—a diffuse leukaemic infiltration, and numerous small leukaemic tumors.

The kidneys are usually pale, and often enlarged, the capillaries may be distended with leucocytes, and leukaemic tumors may be found generally in the cortex.

The respiratory system is not often the seat of important lesions. Lymphoid growths have been found in the mucus membrane of the trachea and bronchi, and occasionally in the lungs,

where they may closely resemble tubercles, but differ from them in having no tendency to caseate or soften.

In the digestive system, the stomach rarely presents any change other than catarrhal; the intestines have in many cases been the seat of tumors which have originated in the solitary and agumated glands. In a few cases the bowel lesions have been so pronounced that the term intestinal leukaemia seemed justifiable.

The changes in the blood are so characteristic that they form the most prominent mark of the disease; the lighter color is more and more marked as the disease progresses; the increase of leucocytes is continued and progressive, leading in its regular progress to the death of the patient. The proportion of colorless corpuscles finally reached is very great as high as 1-3 or 1-2. The red corpuscles are not only relatively, but absolutely diminished. The specific gravity is lowered; the water and febrine are increased, and iron considerably diminished.

The most prominent symptoms are weakness, exhaustion, difficulty in breathing, paleness, and emaciation and profuse sweating. Among the most striking symptoms of splenic leukaemia, are to be reckoned haemorrhages. The intestinal evacuations are interfered with, at first constipation alternates with diarrhoea, while later the diarrhoea predominates, becomes copious and frequent, and sometimes bloody. The urine excretion is in most cases normal in quantity, but toward the end always diminished.

In most cases a considerable disturbance in the temperature is manifested, in the early stages there is only slight variation, but when the disease is well advanced there is always fever of the remittent or of the continuous type.

The appetite, in most cases normal, is rarely diminished, but is sometimes much increased.

The complications may be summed up as serous or sanguiniferous exudations into the cranial, pleural, and abdominal cavities, oedema and congestion of the lungs, pleuritic and peritoneal inflammations and adhesions, and thrombi from the plugging up of the vessels by leucocytes.

The course of the disease is slow and chronic. In exceptional instances, usually in young subjects, it runs a rapid course, but acute leukaemia is rare.

Death takes place usually by asthenia—a gradually progressive weakness, and finally failure of the heart. Diarrhoea and haemorrhages hasten the result. Pyaemia and rupture of the spleen are mentioned as causes of death in some cases.

The positive diagnosis depends upon the determination of a great and persistent increase in the white blood corpuscles.

The prognosis is unfavorable in the highest degree; when firmly established, the spleen and glands are enlarged, the blood condition is marked, and haemorrhages and dropsics are present, death is the only termination to be expected.

INFLUENZA IN HORSES.*

BY DR. GEORGE FLEMING.

Of the few diseases about which there is now anything approaching the mystery that not long ago enshrouded so many epizootic and epidemic disorders, influenza probably holds the foremost place, so far as obscurity of origin, cause of diffusion, or mode of generalization are concerned.

As I have shown in my work on "Animal Plagues," this malady—or one more or less closely resembling it—has been known for many centuries; attacking at one time the human species only, at another time the equine species, and in some outbreaks both species at the same period, or one species shortly before the other.

In tracing its history I have been able to discover a serious and wide-spread disease among horses in Yemen, Arabia, so long ago as A. D. 1328; this was more of a bilious fever, however, if one may hazard a guess from the symptoms described. But, in reality, the more extensive invasions have only been recorded for about two hundred years and, as I have mentioned, some of these have coincided with influenza in man. In the last century records there is some allusion to these coincidences. Huzard, for instance, speaks of influenza attacking horses in the spring of 1776, after the human species had been affected. And in this century it so appeared in 1803, 1805, 1833, and 1858.

But by far the largest number of outbreaks among horses occurred without mankind being in any way involved.

Some of the influenza epizooties have been very remarkable for their wide and rapid diffusion, but I cannot refer to these now without encroaching too much on the time and patience of the meeting; so those who are curious in the matter of the history

* Read before the Border Counties Veterinary Medical Society.

of the malady are referred to my volumes on "Animal Plagues." I may make mention, however, of the remarkable epizooty of catarrhal influenza that occurred throughout Germany, Bohemia, and Moravia in 1746; and to the perhaps still more extraordinary one, and certainly the best recorded, that appeared on the American Continent in 1872-73. This outbreak seems to have commenced in Toronto, Canada, in September, 1872, and radiating thence in every direction, it visited all the cities and towns in Canada, and spread over the United States as far south as Virginia, and westernly as far as Chicago. Within two months it had invaded the States and Territories of the far West; it spread over California and, travelling onward, at last reached British Columbia, Cuba, Mexico, and Central America.

As has been remarked, perhaps no other disease with which we are acquainted commences more secretly and suddenly, extends more rapidly, or tends more readily to become a world-wide malady, than this; and notwithstanding our recent experience of it in mankind and horses, it must be confessed that there is very much in relation to its genesis and propagation, as well as to its immediate exciting cause, which still remains for elucidation. I cannot hope to throw any new light upon these obscure points in the pathogeny of the disease; but I will endeavor, to the best of my ability, to bring our knowledge up to date, not only with regard to these points, but also with respect to the sanitary and medical treatment of the malady.

In the first place, then, the question might be asked, What is influenza?

In the human and equine species the term has been applied to an intense febrile condition, occurring suddenly in perhaps a sporadic form for a brief period, then extending rapidly and affecting a large number of individuals—the majority in a village, town, city, country, continent, or even several continents being attacked; and this irrespective of situation, climate, season, surroundings, and even in defiance of all sanitary measures except rigid isolation. So far the malady has the same character in man and the horse. And in the symptomatology, to some extent, there is a close resemblance, if not absolute identity.

In the old descriptions of the outbreaks of influenza the disease appeared as a severe catarrhal fever, accompanied by great depression and sickness, and running its course rapidly. We do not find much mention of complications, or of any special symptoms predominating in different invasions, except those of catarrh.

But whether these were not observed, or were not present, or whether we have now more than one disease, or a disorder somewhat multiform, certain it is that at one time we have among horses a widely prevalent affection, characterized by certain marked features; at another time, another outbreak as general, in which these are either absent, or masked by characters still more striking; and, again, in another epizooty we shall have symptoms that would almost lead to the belief that we have quite another disorder to deal with. These differences are not marked in individual cases in the same outbreak, but constitute general characteristics of different invasions.

Notwithstanding these diverse manifestations, there are certain features which are always present in all the outbreaks, and which compel us to cling to the old and vague term, influenza. These are the abrupt onset of the malady—the very sudden transition from vigorous health to intense prostration—from normal temperature to extreme hyperpyrexia—from activity and gaiety to immobility and profound depression in a few hours. In no disease with which I am acquainted does the temperature rise so high and so rapidly, and the physiognomy of the disorder is generally so striking, that the veriest tyro could not mistake it for any other disease. The drooping head and ears, listless look, swolled, tearful eyes, and general facial expression, betray cephalalgia, debility, and nausea; while the hot, dry skin, the pasty, burning mouth, the internal temperature reaching, perhaps, 106° or 107° Fahr., and the almost suppressed secretions—all testify to the remarkable pyrexial condition of the animal, which is still further accentuated by the pulse and respirations; at the same time the disinclination to move—the desire to remain fixed in one spot, and, if compelled to stir, the groans and stiffness—betray muscular soreness in loins and limbs.

Another feature is the rapid loss of condition—a fat animal soon becoming much reduced in bulk; but this change might be anticipated when the very abnormal high temperature—synonymous with greatly increased tissue oxidation—is considered; and the extraordinary drop in the temperature that ensues when convalescence sets in is also to be noted. I have found it in some instances as low as 97° degrees Fahr.—the normal temperature of the horse being estimated at 100°.

Whether we have one disease presenting itself in different forms at different outbreaks, or whether different diseases are included in the designation of influenza, these general symptoms

are always present in a more or less degree, and constitute the special features of the epizooty.

If we assume that there is only one influenza, then we must take cognizance of its different forms, and in this regard—and notwithstanding its offering itself as a somewhat bewildering multi-form disorder—it may be accepted that it shows itself at different outbreaks in either of three forms, which are sufficiently distinct; though there may be complications, or accidental epiphenomena, to obscure them in individual cases.

First Form.—The simplest form is the catarrhal, in which the mucus membranes of the head are chiefly involved, and, consecutively, those of the deeper air-passages, often leading to capillary bronchitis and broncho-pneumonia under unfavorable conditions. This is perhaps the most common form of influenza, and the one which is attended with least mortality; though the general symptoms I have already alluded to may be present in their greatest development. This is the form, also, with which we are so familiar in mankind; and it is that which, both in man and the horse, becomes at times of world-wide prevalence.

But it may here be necessary to add that, however closely allied the influenza of the horse and that of mankind may be in their origin, mode of extension, and symptomatology, yet we cannot admit their absolute identity; inasmuch as the influenza of man cannot be conveyed to the horse, nor that of the latter to the human species. There is not a well-authenticated instance on record of such transmission having occurred, notwithstanding the comparative frequency of outbreaks of the disease, even within my own recollection. If such transmission were possible—at any rate, from horse to man—it must have been observed in our mounted corps in the army, where such close attention is paid to sanitary matters, and where the men are always in such close contact with their horses, whether these be well or ill.

Not only this, but the greatest outbreaks of influenza in man have not been coincident with those in the horse. When the human populations of countries far and wide have been prostrated and panic-stricken by the mysterious invasion, horses remained unaffected; and when the majority of the horses in towns and cities have been incapable of leaving their stables, because of being under the sway of their influenza, their immediate attendants, as well as the inhabitants of these towns and cities, were unaffected. Every outbreak in this country furnishes evidence of the fact that the human and equine influenza are not due to the

same, but to closely allied exciting causes, and that the factor or factors which produce the disease in the one species will not do so in the other. No better, because, perhaps, no stronger, proof of this could be adduced than that yielded by the great influenza epizooty of the American continent in 1872-73, when all horse traffic was for a while suspended, and the streets of the large cities were comparatively silent, because of the plague-stricken condition of the horses. And yet there was not a case of influenza recorded among the people. It was somewhat the same during the present year, when human influenza had spread to nearly every part of the world, and horses remained free from it.

It is somewhat curious that horses and mankind should be the only creatures to suffer from influenza. The history of animal plagues shows that dogs and cats have, at rare intervals, been attacked by an epizootic catarrhal fever; but these happened long ago, and though horses and mankind have been frequently visited by influenza, yet dogs and cats have remained immune, and there is not an instance known of their having been infected from man or horse.

This catarrhal form of influenza is that which becomes most generally and most widely diffused—in serious outbreaks as many as 80 or 90 per cent. of the horses becoming affected; though the mortality may not be greater than from 2 to 4 per cent. of those attacked, and convalescence is rapidly established unless there are grave complications.

Second Form.—The second form differs from the other in that, besides the general intensely febrile and adynamic symptoms which mark influenza in its several forms, the chest is chiefly involved—in fact, the disease might be termed epizootic pleuropneumonia of equines. It differs from the other form in being more insidious in its invasion, less wide-spread, in that it does not invade entire countries, but is limited to certain towns, portions of towns, and even certain stables or barracks. Indeed, it would almost appear to be enzootic; for we have a barrack in London, in which a regiment of the Household Cavalry is located—Regent's Park Barracks—in which almost every year there is an outbreak. Rarely witnessed in stables containing only a few horses, this form appears where large numbers are kept, and it is perhaps the most troublesome form to contend with, as it is attended by the largest mortality, and is followed by the most protracted convalescence. Sanitary arrangements did not seem to have much influence on its extension, as it manifests its presence

in good stables as well as bad ; though there must be some local influence at work to account for its erratic course, distribution, and persistency in some places, while others remain exempt—though adjoining those infected—or the disease soon disappears if it does invade them. Catarrhal symptoms may be entirely absent, a very slight nasal discharge of a transparent yellowish fluid only being noted. Almost from the commencement there are indications that the lungs are extensively involved ; and yet so intense is the debility that—contrary to what usually happens in sporadic pneumonia—a stricken animal often lies down—particularly towards the end of the attack, when dissolution is impending. A septic or gangrenous condition of the lungs is indicated—even before death occurs—by the odor of the exhaled air from the nostrils, and the putrid blood discharges from the same openings ; indeed, it is not unusual to find, on *post mortem* examination, that there are local hemorrhages into various tissues and organs, and general appearances which would lead to the supposition that the horse had succumbed to septicæmia.

Third Form.—This form is like the last in so far that it is erratic and limited in its spread, appearing only here and there in towns, and in being localized in districts or counties. But it differs from it in the skin and subcutaneous tissues being mainly involved—in fact, the disease might be considered as erysipelatous. The head and limbs are the parts chiefly attacked, and sometimes these attain a great size ; the lower surface of the chest and abdomen also frequently share in the tumefaction. The digestive organs are implicated in some outbreaks of this form of influenza ; their mucus membrane, and also that lining the nasal passages being congested, softened, ecchymosed, and in severe cases sloughing in patches. In this form convalescence is somewhat long, but the mortality is not very great when proper treatment is adopted. These are the forms which, I think, we may assert that influenza assumes. Of course they may be modified in individual cases by circumstances ; but their general features will be recognized by those who have had a considerable experience of the disease.

With regard to the cause of influenza, I do not hesitate to class it with those maladies which are produced by microbes ; and this notwithstanding the fact that no special organism has yet been fixed upon as the influenza germ. But that it will be isolated, examined, cultivated, and its life history studied, I entertain no doubt whatever ; indeed, it may happen that we

shall be able to utilize it by compelling it to provide an antidote for its bane. The development, course, and symptoms of the malady point out in the clearest manner that it is of microbic origin; though whether the three forms I have referred to are due to one and the same germ is extremely doubtful.

The erysipelatous form reminds one very much of one of the forms of anthrax met with among horses in India, in which external swellings are a special feature. Indeed, the Austrian veterinary surgeons are inclined to regard this form of influenza as anthracoid in its nature; and they base their opinion on the fact that they have found anthrax bacilli in the exudations and tissues of sick animals. But anthrax, as we see it in India, is much more rapid in its course and fatal in its termination than this form of influenza. However there is no reason why the microbe producing it should not be a modification of the *Bacillus anthracis*, modified by climate and other conditions. At any rate, it appears to be proved that the pectoral form of influenza of the horse is due to diplobacteria; and the analogy of the disease to septicæmia is further strengthened by the circumstance that, when these bacteria are inoculated into mice, these rapidly die of septicæmia.

The catarrhal form of influenza may be due to another kind of micro-organism—probably the pneumococcus or the bacillus of Friedlander.

Climate and temperature do not appear to have any influence in its production. It prevails in the most diverse climates and at all temperatures and the closest and most extensive and recent observations show that it does not spread by virtue of any of the recognized conditions of cold, heat, humidity, season, climate, or altitude. In the epizooty of the American continent it prevailed and was propagated in the cold of a northern winter, and in the summer heat of Central America; in the dry air of Minnesota, and in the moist air of the seaboard; at an altitude of 5,000 feet above the sea (at Saltillo, Mexico), and on the low levels of New Orleans (10 feet above sea level). And it is certainly not disseminated by winds, but often spreads against them.

The notion that influenza is due to an excess of ozone, or the presence of any gaseous or material product in the atmosphere, cannot be entertained nowadays. If such were the case, many other species of creatures besides man and the horse would suffer at the same time. This does not seem to have struck those who, for so many years, have tried to account for the prevalence and extension of the disorder on this hypothesis.

That influenza is infectious I personally have no doubt, though it may be extended in other ways than by immediate contact of sick with healthy horses I am not prepared to deny. The proofs in favor of its infectiousness in horses support my opinion, and this opinion I have entertained for very many years, as will be seen by a reference to my work on "Veterinary Sanitary Science and Police." In the American outbreak of 1872-73, for instance, it commenced at Toronto, and spread thence as from a centre, no locality being exempt which was known to have been in communication by means of horses or mules with places in which the disease existed; and those places which were not visited by it were so situated that the introduction of horses or mules was in some of them impossible, and in others of them improbable. Another proof which I rely upon is that equine influenza has not, so far as I can ascertain, ever been witnessed in Australasia, South Africa, India, or New Zealand, and this because, as I view it, it has never been carried there. The microbe which causes it in horses has no action on other creatures; and it may be taken for granted that, once it obtains access to the body of a susceptible animal, it can multiply in a wonderful manner, in order to produce those chemical changes in the fluids which enable them to act on the organism as if most active septic matter had been introduced into it.

I may call attention to the fact that the ass, which is so nearly allied to the horse, appears to be exempt from influenza; for I have never met with or heard of its occurrence in that animal, and even mules do not appear to be very susceptible.

Of the influences which are at work in exciting the activity of the microbe at certain periods we know nothing. We may assume that it can multiply without as well as within the body, like the germ of miasmatic diseases, and that certain atmospheric or telluric conditions favor its development and multiplication to an astonishing degree. Though we are in ignorance of those conditions which favor the growth and spread of this particular microbe—the existence of which we can only assume for the present—yet it must be confessed that we are no wiser with regard to the genesis and advent of creatures which are well known, and which are also injurious to the interests of mankind. Take the immense swarms of locusts which in some parts of the world, at uncertain periods, sweep over great surfaces of the earth, consuming everything in the nature of vegetation which they meet with on their long flight; or the countless swarms of

field-mice or similar vermin, which spring up now and again, in certain countries, from nobody knows where, and devastate great tracts. Why should similar influences not operate in the evolution of myriads of influenza-exciting micro-organisms?

But experience demonstrates that, if the microbe can multiply outside the body, it can also multiply within it, and that therefore a diseased animal can infect healthy ones; and there can scarcely be a doubt that infection is a potent factor in the spread of the malady.

With regard to the treatment of the disease, I confess to having little faith in the administration of drugs, but rely more on good nursing, cleanliness, plenty of fresh air, ample space, and comfort.

Medicines which act as germicides, when they can be administered with safety, may be given. Those which operate in reducing the fever generally act in this way. For many years I relied solely on preparations of quinine, and have reason to believe that it has an almost specific effect on influenza. Preparations of carbolic acid are, of course, much less expensive, and might have a similar effect; so might antipyrin, and other anti-febrile remedies. But I need not dilate on the treatment of the disease, as I have no doubt you are all perfectly well aware of the necessity for dealing with symptoms as they arise; and as these vary more or less in nearly every case, close watchfulness and keen judgment are needed, and not rule-of-thumb practice.

EXTENT OF REASON IN THE LOWER ANIMALS.

By A. McLAUGHLIN, D. V. S.

The above title was the subject of a paper read before the "Association for the Study of Comparative Psychology," by its President, Prof. McEachran, of McGill University, Montreal, in which he expressed the opinion that the lower animals must be possessed of a complicated mental state allied to our own in order that they may perform the many undoubted intellectual feats which they sometimes do; in other words they must and do reason.

Other papers on the same subject, by the President, and different members, were very interesting. They all insist that the

lower animals are not confined to "instinct" but have, "reason." Now I would like to ask, "who doubts it? what scientific man is there who claims that they do not reason?" The question to my mind should be, not as to whether they have reason, but to what extent they are capable of reasoning.

Instinct, according to Webster, "is a certain power or distinction of mind, by which, independent of all instruction, or experience, without deliberation, and without having any end in view, animals are unerringly directed to do spontaneously whatever is necessary for the preservation of the individual."

This definition confines instinct to a very small compass, and allows for reason a relatively large one, the definition for which might read, "a certain power or distinction of mind, by which, *dependent* on instruction or experience, *with* deliberation, and *with* an end in view, animals perform various acts.

I remember gazing, with a great deal of interest, when young, on a picture in my geography, of the monkeys in Brazil forming a natural bridge with their bodies, by which great numbers of them would cross a river.

Surely these monkeys had a very *plain end in view*, and they *very deliberately* acted to attain that end. It might be argued, that if the monkeys had not such long tails they could not possibly perform such a feat, and instinct, *unerring instinct*, taught them the use of those members as a means to escape their enemies. This argument would make instinct a very complex thing, indeed, so complex that the building of houses for protection from the inclemency of the weather might also be called a more highly developed instinct than that possessed by the monkey, but not greater in proportion as compared with other animals much lower in the grade of intelligence. The popular distinction between instinct and reason seems to be simply this, and it leaves no room for argument. The former is the intellectual faculty of the lower animals, the latter is the intellectual faculty of man.

Have you ever taught a puppy? Have you noticed the evident pleasure it gives him, when he realizes that he has *learned his lesson*, and when you advance him to another, and several lessons, how he watches you with each new trick you try to instil into his brain, his mental processes in a state of tension, anxious to comprehend what you are trying to teach him, but which his small mental calibre cannot as yet perceive; how in his efforts to do, what he does not yet understand, he does all the tricks he is already familiar with, and when he, at last, succeeds in mastering

his last lesson, is he not pleased as well as yourself? Is this instinct? What has your lesson to do with the preservation of the individual or the species; of what use to him as a dog, is the ability at your bidding, to balance himself on a cup, jump through a hoop, etc? Is his evident pleasure, at his *knowledge* that he has pleased you due to instinct?

Here is a collie dog at my feet, as I write, who is thoroughly house-broke. If instinct is "unerring for the preservation of the individual" (which it is not) it is surely instinct to empty the bladder, the bowels, and to vomit, in the most convenient places; but this animal, like thousands of others, will not do either in the house, but instead will walk to the door, and stand there, knowing someone will open it. Does anyone pretend that *instinct* teaches that dog that it has a human being to wait on it? No, it may be instinct to imitate, but it is reason to say as plain as a boy in school, please let me go out, or I will be obliged to soil the floor. It might be argued that the dog is afraid of being punished but is not fear of punishment, a very human reason for doing many acts? But the dog does not always fear corporal punishment, you have taught him it was not right to do it, and for that reason he does not. The dog is a remarkably sensitive animal (at least some breeds); he is even capable of feeling ashamed, right and wrong—as it is taught him. Conscience is the ability to perceive that certain acts are wrong; it has nothing to do with what is right. What certain acts are depends entirely on what we have been taught, and on our surroundings; it is the intelligence of *fear*. It is the dog's training which forms his conscience; it is the same which forms our own. If my dog soils the floor it slinks away from me; *it knows it has done wrong*.

Does a dog understand spoken language? I have often heard this question asked. He knows a whistle, and a chirp; a terrier knows the word, rats! a setter, charge! others will answer to come here! drop it! beg! recognize their name, etc.

I tried the following experiment one day with a collie pup, not over two months old. I had taught him to "bring my gloves," and I wished to see if he would recognize the words. I spoke them in the middle of a conversation with my wife, as though the words were part of another sentence, and did not change my tone in the slightest, my back was toward the dog, but the *instant* I said the words, he left his play, ran into the next room where I had purposely hidden the gloves, and brought them back. I did this several times, and always with the same success. On one occasion

as the little fellow was running out of the room on the same errand, he stopped at the door—stopped short—what is it I am going for, I have forgotten? was as plainly expressed in that moment's halt, as it is possible for an attitude to express a thought; so apparent was the act, that my wife and myself simultaneously expressed ourselves to that effect.

A cocker spaniel was brought to my office one day, with which my dog began playing, but which absolutely refused to join her, but as soon as her owner said, "go and play with the dog," she began romping with a right good will.

Almost any dog can be taught to beg, and how many will beg when they see you eating, plainly asking you to share your goodies.

I saw a little terrier a few days ago standing outside his own door, barking with a right good will. He wanted to get in, that was evident, and this was his method of attracting the attention of the inmates.

Just think what a complicated act that is. He knew his own house, he knew how to enter it, and the door being shut, he knew how to make his presence known. Under similar circumstances could man reason better, or act more to the purpose?

I have said a dog recognizes a chirp and a whistle; he does more; he knows when that chirp or whistle is *not* meant for him, for when I chirp to my horse my dog pays no attention, better than this, if I call another dog, she will help me catch him, as this incident, which happened several times, will prove: Some time ago I had a pup whom I was in the habit of giving an airing on a common, close by. The little fellow would invariably run on the grass, where I could not follow; I always tried to stop him by calling him back, but he never paid any attention; after a time, the larger dog who accompanied us would run after him, when I called, stand over him, and detain him until I caught him.

Dogs have more than instinct, they have, most decidedly, the powers of reason, and dogs are not classed as the highest order of intellect among the lower animals. To say they have not reason is an error, similar to another the laity indulge in, that Nature is a kind and good mother to them, and takes the best of care of them, that that unerring instinct, prevents them indulging in pernicious habits, and preserves them from being subject to those ills with which we poor humans suffer.

I look with interest to the proceedings of the Association; the members are discussing a study that is brimful of good to our profession.

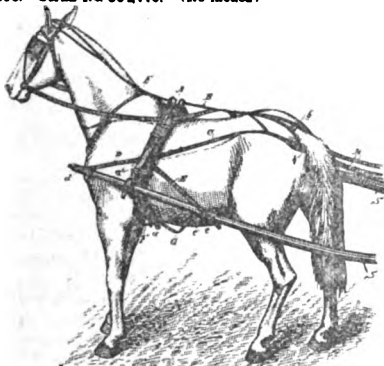
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month ending Feb. 17th, 1891.

445,428. HARNESS JOHN E. FORTER, Ferndale, Cal. Filed Sept. 12, 1890. Serial No. 364,770. (No model.)



Claim.—1. In a track-harness, and in combination with the saddle, back-strap, and crupper, the holdback-straps C, secured at their rear ends to the crupper and at their forward ends to the saddle, and the straps D and E, secured at one end to the saddle, and at their opposite ends to the shafts at a point forward and back of the saddle, respectively, substantially as herein described.

2. In a track-harness, and in combination with the saddle, backstrap, and crupper, and at their forward ends to

the saddle, the straps D, secured at their rear ends to the saddle and having the sockets secured to their forward ends of the shafts, and the straps E, connecting the saddle with the shafts, substantially as herein described.

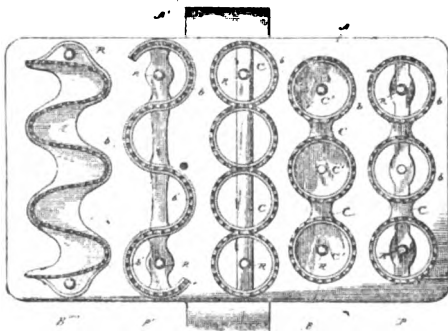
3. In a track-harness, and in combination with the saddle, back-strap, and crupper, the holdback-straps C, secured at their rear ends to the crupper and at their forward ends to the saddle, the straps D, secured at their rear ends to the saddle and at their forward ends to the shafts at a point in front of the saddle, and the tightening-straps E, secured at their forward ends to the saddle and at their rear ends to the shafts at a point back of the saddle, substantially as herein described.

4. In a track-harness, and in combination with the saddle, back-strap, and crupper, the holdback-straps C, secured at their rear ends to the crupper and at their forward ends to the saddle, and a strap on each side secured at its ends to the shafts at points forward and back of the plane of the saddle and at its intervening portion to said saddle, substantially as herein described.

5. The track-harness consisting of the saddle with its belly-band, the back-strap with its crupper, the holdback-straps secured to the crupper and to the saddle, the straps secured to the shafts at points forward and back of the plane of the saddle and to said saddle, the neck-strap secured at its lower end to the belly-band, substantially as herein described.

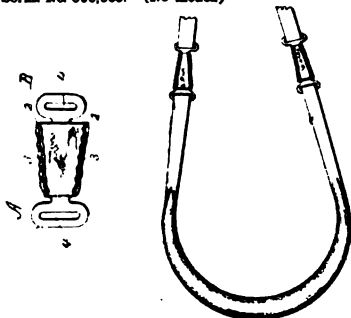
6. In a harness, the combination, with the saddle, of the holdback-straps C and the crupper to which said straps are connected, said crupper having an elongated opening, and a band sliding on the crupper, substantially as herein described.

Claim.—1. In a curry-comb of the class described, the combination, with a flexible back and a loop or handle attached to the one face thereof, of a series of sections fastened to the opposite face thereof in lines approximately parallel to the line of the handle, each of said sections being provided with teeth arranged in curved lines, substantially as and for the purpose set forth.



2. In a curry-comb of the class described, the combination, with a flexible back, of a handle attached to and extending across one face thereof and a series of sections attached to the opposite face of the back in lines approximately parallel to the line of the handle, said sections being provided with teeth arranged in lines made up of a series of reversely-arranged curves, substantially as set forth.

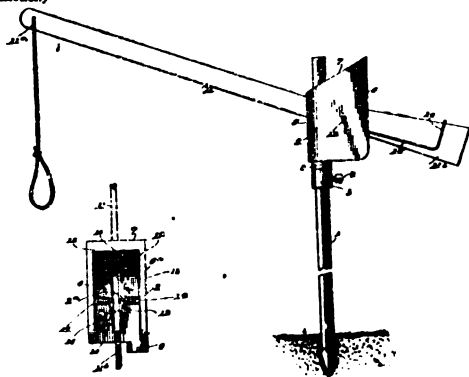
446,380. CRUPPER-FASTENING. GEORGE H. DAVIS, Lacona, N. Y., assignor of one-half to S. H. Barlow, same place. Filed Aug. 4, 1890. Serial No. 360,885. (No model.)



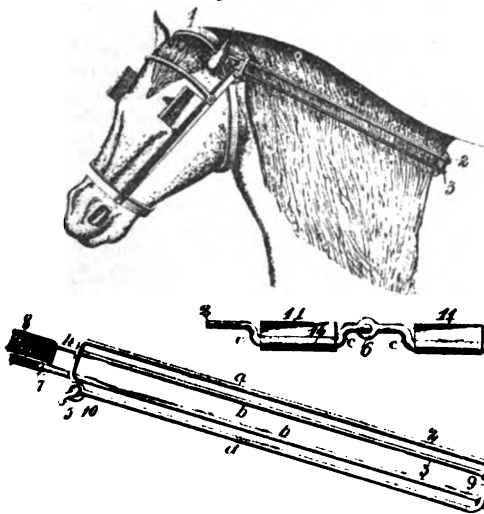
Claim.—A crupper-fastening device consisting of the parts A and B, having their edges turned up and corrugated at right angles to the length of the clamp, and provided with an eye in one end thereof, substantially as described, for the purposes as set forth.

Claim.—In a tether, the combination of a stake, a head-block supported thereon so as to turn, and a spring-operated lever fulcrumed in said block, said block being constructed with a front 5, sides 6 6a, an inclined top 7, into which the upper end of a vertical slot in the front 5 extends, and a boss 9, through which extends a perforation at one corner of the block to receive the stake, said vertical slot permitting vertical play of the lever, substantially as set forth.

445,454. TETHER. FRANCIS M. POWELL and WILLIAM H. VICKERY, Hartwell, Ga. Filed Aug. 29, 1890. Serial No. 363,437. (No model.)



445,485. MANE-HOLDER FOR HORSES. WILLIAM ANNESTON, St. Louis, Mo. Filed May 31, 1890. Serial No. 353,985. (No model.)



Claim.—1. In a mane-holder for horses, a pair of parallel arms or jaws, a locking device formed on said parallel arms and integrally therewith, and a similar pair of arms hinged to said first-mentioned pair, substantially as described.

2. In a mane-holder for horses, a jaw 2, a U-shaped jaw hinged thereto, its free end extending beyond the end of the first-mentioned jaw forming a loop, whereby it may be secured to the harness, and a collar on the jaw 2 between the ends of the other jaw, substantially as described.

3. In a mane-holder for horses, a jaw 2, a second jaw hinged there-

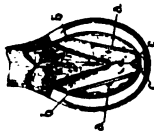
to, an eye on one end of jaw 2, and a hook upon the other end to engage the eye, substantially as described.

4. In a mane-holder for horses, a jaw 2, a second jaw hinged thereto, corrugated plates on each of said jaws, and means whereby said jaws may be fastened together, substantially as described.

5. In a mane-holder for horses, a jaw 2, a second jaw hinged thereto, each of said jaws having depression, corrugated plates located in said depressions, and elastic material on said corrugated plates.

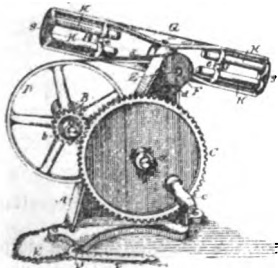
Claim.—A hoof-ex-

445,778. HOOF-EXPANDER. MICHAEL BRAGGITT, Baltimore Md. Filed Nov. 25, 1890. Serial No. 372,610. (No model.)



pander formed of a single piece of spring metal and comprising a pair of diverging arms *a*, each having a lateral prong *b* at its outer end, two toe bends *c* at the converging ends of the arms, and a U-shaped double back bend *d*, connecting said two toe bends and occupying a position between the said arms *a*, as and for the purpose set forth.

446,348. MILK TESTING AND SEPARATING MACHINE. DYER COOPER, Philadelphia, Pa. Filed July 16, 1893. Serial No. 230,111. (No model.)

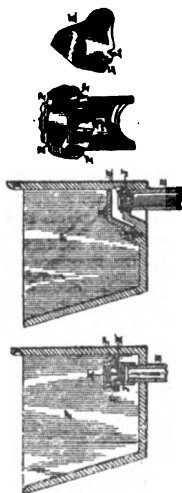
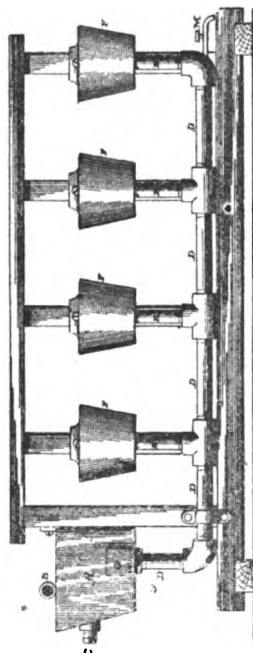


Claim.—1. The com-

bination, in a milk testing or separating machine, of the frame, an open-armed spider mounted on said frame, and mechanism, substantially as described, for driving the spider, said spider having sockets with yielding seats therein, crossheads *e* on the spider, having pockets, glass tubes adapted to the sockets and pockets, and an elastic fastening passing transversely across the tubes, substantially as set forth.

2. The combination of the testing-tubes with the spider having arms with pockets for said tubes and elastic retainers for holding the tubes in the pockets, substantially as described.

445,920. DEVICE FOR WATERING STOCK. CHARLES E. BUCK-
LEY, America Union, N. Y. Filed Oct. 17, 1890. Serial No. 333,334. (No
model.)



Claim.—1. In a device for watering stock, the combination, with a main reservoir and a distributing-pipe connected therewith, of a series of receptacles connected with the same distributing-pipe, inlet-pipes extending into the receptacles above their bottoms, a cover placed over the upper ends of the inlet-pipes, having a flange depending below the inlets, valves in the inlet-pipes and under the cover, and inlet-openings below the said valves, substantially as specified.

2. In a device for watering stock, the combination, with a main reservoir and a distributing-pipe connected therewith, of a receptacle, an inlet-pipe extending into the receptacle above its bottom, and a cover placed over the upper end of the pipe, having a flange depending below the inlet and inlet-passages, combined for the purpose described.

3. In a device for watering stock, the combination, with a

main reservoir and a distributing-pipe connected therewith, of a receptacle, an inlet-pipe extending into and above the bottom of the receptacle having longitudinal grooves, and a cover having a depending flange and which is placed over the inlet-pipe, substantially as shown.

Claim.—1. A controlling-gear consisting of an auxiliary bit, an independent rein attached thereto, nose and head guides for said rein, and a pivoted lever on the vehicle having a friction-pulley around which the independent rein runs before it is attached to the wagon body, substantially as described.

2. In a controlling-gear of the character described, the combination of a checkrein, a water-hook ring, a button thereon over which the checkrein is engaged, a friction-roller engaged in the bight of the checkrein behind the water-hook ring, and a connecting-rein engaged with the roller and extending back to the vehicle, substantially as described.

3. In a controlling-gear of the character described, the combination of a slotted

446,067. CONTROLLING-GEAR FOR DRAFT-HORSES. ROBERT S. KINKADE, Lexington, Ky. Filed Nov. 16, 1889. Serial No. 330,503. (No model.)

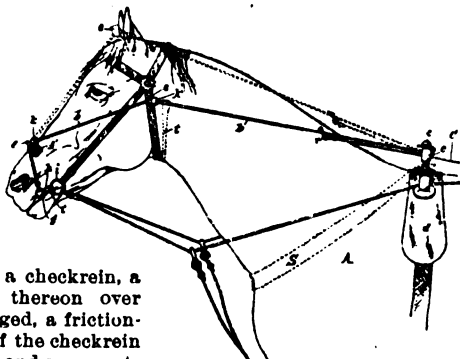
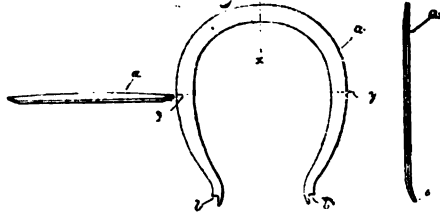


plate adapted to be attached to the bottom of the vehicle, a guide-roll mounted thereon, a lever fulcrumed upon said plate and operating through the slot, a pivoted roll carried at the end of the lever, and a connecting-rein secured at one end to said plate and passing thence around said roll at the end of the lever and forward ultimately to and connected with a bit in the mouth of the animal, substantially as set forth.

Claim.—1. The lyre-shaped heel-expanding spring consisting of the thin flat bar widest at the middle and gradually tapered to the ends and having the pitch in the cross-section of the bar oblique to the plane of the entire spring, substantially as described.

2. The lyre-shaped heel-expanding spring consisting of the thin flat bar widest at the middle and gradually tapered to and upturned and outwardly projecting at the ends and having the pitch of the cross section of the bar oblique to the plane of the entire spring, substantially as described.



NECROLOGY.

The veterinary profession will hear with deep regret of the death of John H. Steel, F. R. C. V. S., Army Veterinary Department, which occurred at Bombay, India, on January 20th.

Although only 35 years of age, Mr. Steel had accomplished through his phenomenal enthusiasm, distinguished ability, and untiring energy, a degree of success which will make his name one of the lasting monuments of the veterinary profession, and his promise, for the future, makes his loss not only a bereavement to his friends, but a catastrophe for veterinary science.

Mr. Steel graduated in 1875, and soon after joined the Army Veterinary Department; in this he only remained a short time, as he accepted an appointment on the teaching Staff of the Royal Veterinary College. This position, after a brief period, he found unsuitable and joined the army, soon afterward proceeding to India. Stationed at Bombay, he commenced a career of wonderful activity. Mainly through his influence the Bombay Veterinary School was established, and as Principal he was instrumental in making it a most useful and recognized educational establishment. By the authorities in the Bombay Government his services were highly appreciated and the annual reports of the School afford evidence that he well deserved all that he said of him by

those who were made aware of what he had done and was doing for the presidency. In fact, Mr. Steel was a most valuable public servant outside the college, and in everything relating to animals he was consulted and valued as an authority. This caused him to be elected to discharge many functions beyond his own special duties. The Governor of Bombay, Lord Reay, appointed him a Justice of the Peace, and the Bombay University conferred upon him the honorary degree of Fellow.

His writings are numerous and well known. We may mention his "Outlines of Equine Anatomy," "Diseases of the Elephant," "Canine Pathology," "Bovine Pathology," and the quite recent "Treatise of the Diseases of the Sheep," a review of which will appear in the next number of the JOURNAL. He was also one of the Editors of the *Quarterly Journal of Veterinary Science*, in India (Mr. Fred. Smith, Army Veterinary Surgeon, being the other), and in this periodical appeared many valuable and interesting papers from his pen.

He was a Fellow of the Royal College of Veterinary Surgeons, and of the Zoological Society, and it was owing to his efforts that the National Veterinary Association was begun; he was its first Secretary.

STATE OF WISCONSIN.

The following letter has been issued to all veterinary graduates in Wisconsin, so far as their names were known.

February 20, 1891.

DEAR SIR :

After conferring with many of the veterinary graduates of the State, we have reached the conclusion that the time has now arrived for the formation of an association to be composed of graduates only. With this purpose in view you are invited to meet with us at Madison, on the 18th of March. Our headquarters will be at the rooms of the State Agricultural Society in the Capitol.

Invite any *regular graduate* to come with you.

Cordially yours,

V. T. ATKINSON,

State Veterinarian.

SOCIETY PROCEEDINGS.

California State Veterinary Medical Association.—In February, 1888, Drs. Maclay, Fitzgerald, Bowhill, all members of the Royal College of Veterinary Surgeons, met in an office in San Francisco. A discussion of the merits of the veterinary profession and of the important issues relating to it, which needed guidance and regulation for the protection of the people, for the benefit of animals and for the profession itself, resulted in a resolution to form a State organization. A call was made to the Veterinary Profession in California through the Public Press. A few veterinary surgeons responded: an organization was effected. Dr. Thomas Bowhill was chosen President and temporary officers were appointed to carry on the business of the Association. At a subsequent meeting, 13th of March of the same year, a number of others joined and the constitution and by-laws were adopted. On the 28th of January, 1889, the association was incorporated under the laws of California, naming as directors for the first year, Dr. Thomas Maclay, of Petaluma, Chairman; Dr. Thomas Bowhill, of San Francisco, and Dr. A. M. McCallum, of Sacramento.

Under the incorporation a new set of By-Laws were adopted and as officers for the ensuing year Dr. Thomas Maclay was elected President; Dr. W. E. D. Morrison, Vice-President; Dr. A. M. McCallum, Secretary; and Dr. W. H. Woodruff, Treasurer. A Board of Examiners was also elected. At about this time the Directors had a bill presented to the California Legislature then in session at the capital of the state, entitled "An Act to Regulate the Practice of Veterinary Medicine and Surgery in the State of California." The bill passed the Senate and Assembly, but upon reconsideration in the lower house was beaten by four votes. After the defeat of the bill the association continued to hold its quarterly meetings and in December, A. D., 1889, the annual meeting was in Los Angeles, at which the officers named as above were re-elected for the ensuing year. In the meantime the Association continued to grow in strength and the benefit of organization began to show itself, and to-day there are very few graduates in the commonwealth of the Golden State who are not members of the Association.

The Annual Meeting of the Association for 1890 was held on the 11th and 12th days of December, at the Capitol Hotel, Sacramento.

On the evening of the 11th, the meeting was called to order with President Thomas Maclay in the chair. The following named members being present: Drs. Morrison (Vice-President) and Witherspoon, of Los Angeles; Dr. Rowland, of Pasadena; Drs. Masoero, Egan, and Woodruff, of San Francisco; Dr. Orris, of Stockton; Dr. Spencer, of San José; Dr. Wadams, of Santa-Clara; Dr. Parent, of Hollister, and Dr. McCallum, of Sacramento.

Letters of regret for non-attendance were read from Drs. Blackington, Whittlesey, and Oliver, of Los Angeles; Dr. Pierce, of San Diego, and Dr. Burns, of San Francisco.

The minutes of the last quarterly meeting were read and approved. The annual reports of the Secretary, Treasurer, and Finance Committee were read, and on motion the same were adopted. The election of officers for the ensuing year resulted as follows: President, Thomas Maclay, of Petaluma; Vice-President, W. E. D. Morrison, of Los Angeles; Secretary, A. M. McCallum, Sacramento; Treasurer, W. H. Woodruff, San Francisco. Board of Directors: Dr. H. A. Spencer, Chairman, of San José; Dr. W. E. Wadams, of Santa Clara, and R. S. Whittlesey, of Los Angeles. Board of Examiners: Dr. Thomas Maclay, Chairman, of Petaluma; Dr. C. Masoero, of San Francisco; Dr. T. B. Rowland, of Pasadena; Dr. W. E. D. Morrison, of Los Angeles, and Dr. W. F. Egan, of San Francisco.

Dr. H. A. Spencer, of San Jose, read a paper on Emasculation of Horses. He regretted the numbers of traveling gelders "thoroughly ignorant of the parts they assail, or the pathology of the many untoward sequels," while acknowledging the expert proficiency which they may attain, he regrets that "This fact is more lamentable because these men not unfrequently make their operations a stepping-stone towards grappling with more serious matters, in the way of treatment of diseases and injuries." He pointed out the merits of the "Spencer hobbles." When ligation is used he prefers cotton to silk as the former rots and comes away with the slough. He denominated as "flankers," that class of horse, "where one testicle has not descended into the scrotum, but lies external to the abdominal wall and above Poupart's ligament and is held there by the pressure of the thigh," in contra-distinction to "ridglings" which he classes as those in which the testicle has not descended, and where "there is no canal."

He finds that the "yard-reared" colt requires much more attention after operating, than those raised and kept at pasture.

The paper called up a very lively discussion not only regarding the various methods of operating but also the several methods of casting colts and horses. The meeting then adjourned to meet the following day (the 12th) at 2 o'clock P. M.

On the morning of the 12th the members met at Dr. McCallum's Infirmary for the purpose of witnessing a practical illustration of Dr. Spencer's hobbles, which gave great satisfaction. Throwing horses with a single rope was also practically demonstrated by Dr. Rowland, of Pasadena. A "four-in-hand" took the members to the Rancho Del Paso, the property of J. B. Haggin, Esq., where lunch was served, the Superintendent acting as host. The different "corrals" were visited, the get of the great thoroughbreds were examined, Salvador, Hidalgo, Midlothian, Ben Ali, Joe Daniels, Miss Woodford, etc., etc.

At 2 o'clock P. M. the association was called to order. All the members present on the previous day were in attendance.

The secretary read a letter from Dr. Creely, the essayist of San Francisco, stating that he would be unable to attend the meeting.

Drs. Morrison, Rowland, Spencer, and Masoero, then described some important cases that had come under their notice since the last quarterly meeting of the association.

The subject matter of the bill to Regulate the Practice of Veterinary Medicine and Surgery in the State of California, was then taken up and dis-

cussed, preparatory to the presentation of the same to the Legislature now in session. After several amendments had been made to some of the sections of said bill, a resolution was introduced calling for the appointment—by the chair—of a committee of three, for the purpose of having said bill presented to the present Legislature, also, to urge the final passage of the same, whereupon, the president appointed Drs. Rowland, McCallum, and Egan, to act as such committee.

At the commencement of this meeting an application for membership was read from Dr. Davenport, of Santa Rosa, the same was referred to the Board of Examiners, and was reported favorably. Dr. Davenport was admitted a member of the association.

The meeting then adjourned, to meet in San Francisco in March. In the evening the annual dinner took place, the president occupied the chair. Plates were laid for twenty-five, members and visitors. The usual patriotic toasts were given and responded to.

THOMAS MACLAY, M. R. C. V. S. *President.*

New Jersey State Veterinary Society.—The second annual meeting of the New Jersey State Veterinary Society was held in Saenger Hall, city of Newark, on Thursday February 5, 1891. Meeting called to order promptly at 2 P.M. The President, Dr. E. Loblein occupying the chair. On roll call the following members answered to their names: Drs. Autenreith, Corlies, Hopkins, Krowl, Loblein, Lowe, Pacock, Sattler and Sellers. Minutes of last meeting were read and approved. It was regularly moved and seconded that the application of Dr. Dorney be laid on the table, carried. Moved and seconded that the secretary communicate with the Dean of the New York Veterinary College and find whether Dr. Otto Von Lang is a graduate of said college, carried. Dr. Hopkins proposed the following Veterinarians for membership, Drs. T. H. Ripley, E. R. Ogden, E. C. Batten and W. F. Harrison. The applications were referred to the Board of Censors for action. Dr. Lowe, on behalf of the United States Veterinary Medical Association extended to the New Jersey State Veterinary Society an invitation to attend their next meeting to be held in Washington, D. C., September next. On motion the invitation was accepted. On motion the bill presented by the secretary for printing, postage, etc., was ordered paid.

The use of sulphate of strychnia by hypodermic injection in Purpura Haemorrhagia was the subject of lengthy remarks by Dr. Hopkins, of Newark, who claimed that in one-eighth grain doses he has had remarkable success; before using this treatment his percentage of loss was great, but since using strychnia he has cured every case that he treated with it. He advocates the hypodermic injection of strychnia in one-eighth grain doses, every four hours, injected into the healthy tissues continued as soon as the case will permit with tonics, given by the mouth, iron, cinchona, gentian, etc., he stated cases that apparently were in the last stages of the disease which were completely cured by his treatment; in cases where the disease was just making its appearance, the disease was checked almost immediately. In fact in every case that the treatment was used, the patient improved as soon as the treatment was commenced.

Several cases of luxation of the patella due to rhino adenitis were reported, causing considerable discussion, the luxation was considered to be due to muscular relaxation, the case being exceedingly rare. Dr. Krowl gave the symptoms of a very interesting case of Melanosis in a black mare, he stated the impossibility of making a correct diagnosis, owing to the fact that the only place of the pigmentary deposit was in the kidneys, the kidneys degenerated, and formed abscesses which broke in the abdominal cavity causing death.

On motion it was agreed to hold the annual meeting in New Brunswick, adjourned.

A. T. SELLERS, D. V. S., *Secretary*.

United States Veterinary Medical Association.—At a special meeting of the Comitia Minora of the United States Veterinary Medical Association, held at the Hotel Royal, New York City, on January 27, 1891, at 8 P. M., the following members were present: Drs. Coates, Huidekoper, T. B. Rayner, William Dougherty, Hoskins, James L. Robertson, R. A. McLean, and Winchester. Absent: Drs. Williams, Butler, and Lyford.

Chairman Coates stated the objects of the meeting and Secretary Hoskins offered the following resolution: "That we recommend to the Association that the meeting for 1893 be held in Chicago and that it be International in character." After some discussion an amendment was offered and accepted that a committee of three be appointed to propose the subjects for discussion, which was carried.

The place for the convention of 1891 was then considered, the Secretary reading appeals for Boston, Baltimore, and Washington, with a letter from Dr. Williams, one of the Western members of the committee and, after discussion, a motion was made that we meet in Washington, D. C., which was carried.

A motion was then offered and adopted that a committee of three be appointed to complete the necessary arrangements, and the Chairman announced the names of Drs. Huidekoper, Hoskins, and Dougherty, as the committee.

After the disposal of some other routine matters the meeting adjourned.

W. HORACE HOSKINS, *Secretary*.

Ontario Veterinary Medical Association.—The Ontario Veterinary Medical Society, which is connected with the Ontario Veterinary College, Toronto, Canada, meets semi-weekly in the College Hall. It has for its aim, the discussion of various subjects, in the way of Essays and Communications, furnished by its members, who consist of the Graduating Class, and in so doing, improving its members, in subjects pertaining to their profession.

The office bearers for 1890-91 are: President, Prof. A. Smith, F.R.C.V.S., Ed.; Vice-Presidents, Prof. J. Thorburn, M. D., Ed., Prof. J. Duncan, M. D., V. S., Prof. A. King, M. D., V. S.; Secretary, A. Z. Keelor; Assistant Secretary, S. Sisson; Librarian, W. Corlis; Treasurer, E. C.

Porter. The following papers have been read before the Society in the way of Essays and Communications during the month of February, and were well discussed by members present. Essays: "Breeding the Trotter," by D. C. Langford; "Physiology of Kidneys," by J. E. Foster; "Animal Intelligence," by H. F. Vulliamy; "Contagious Pleura Pneumonia," by W. Gray; "Anthrax," by W. R. Taylor; "Bacteria," by A. G. Hopkins, and "Ergotism," by J. G. Parslow. Communications: "Bursatte," by U. B. McCurdy; "Laminitis" by A. J. Morrison; "Castrating a Riding Horse," by A. K. Kellam; "Fracture of the Metacarpal Bone," by G. W. Moore; "Ovariectomy in a Heifer," by J. H. Honan; "Firing in Ring Bone," by J. A. Pendergast and "Fracture of the Os Pedis," by J. W. Rollins.

ALLEN Z. KEELOR, *Secretary*.

New York State Veterinary Society.—The first Annual Meeting of the New York State Veterinary Medical Society was held at the Parlors of the Vanderbilt House. Syracuse, N. Y. The meeting was called to order by Presd't Morris at 2 P. M. January 16. The following Members responded to the Roll Call by the Secretary Dr. N. P. Hinkley. Drs. Jno. A. Bell, James Carnrite, A. Drinkwater, W. G. Dodds, O. B. French, Wilson Huff, N. P. Hinkley, J. G. Hill, E. D. Hayden, Prof. James Law; Drs. G. H. Moulter, Claude D. Morris, M. M. Poucher, D. K. Seltzer, Robt. Somerville, Harry Sutterby, Frank Sutterby, Jno. Wende. Letters and telegrams of regret were then read from, Prof. Liautard, New York; Prof. Smith, Toronto; Dr. A. L. Aunter, Dr. A. N. McQueen, Dr. Chas Cowie, and several others. President Morris read his Annual Address.

The President asked the Board of Censors to investigate the Credentials of Applicants for Membership. The Chairman of the Board, Dr. H. Sutterby reported in favor of the following gentlemen.

Dr. Louis Robinson, Buffalo; Dr. Wm. Kirk, Niagara Falls; Dr. J. M. Chase, Poplar Ridge; Dr. P. K. Sidebottom, Rochester; Dr. Geo. Gowland, Auburn; Dr. H. S. Wende, Tonawanda; Dr. E. A. Wieland, Buffalo; Dr. Wm. H. Carpenter, Johnstown, N. Y.

On motion of Dr. H. Sutterby seconded by Dr. Drinkwater, the above gentlemen were duly declared elected Members of the Society. The Secretary read the minutes of the last meeting all of which was approved as read. There being no unfinished business the President called upon the Chairman of the Committee of Arrangements for his report. Dr. Hinkley read the report which was duly accepted with thanks. Dr. Sutterby here took occasion to ask the opinion of the Members as to having one day's Session instead of two, at the regular meetings. Giving as a reason that it was taking up too much valuable time. He thought if the members could come to the place of meeting the night before, and call the meeting to order early in the morning, that the business might be properly done in one day. Dr. Bell opposed and gave good reason for having two days' session. Several members entered into a discussion about making the change. It was put to a vote which resulted unanimously in favor of a one day's session and so declared. Then followed the report of the Committee on Publications which was also accepted.

The report of the Committee on Legislation was called for. The Chairman Dr. C. D. Morris briefly outlined the present so-called Law, and also reported why the proposed Law was defeated at the last session. He also spoke about the lack of knowledge about the Veterinary art of some of the members of the Legislature. Also the want of union among the Veterinary Surgeons. He also read the proposed Act for the benefit of the new members and to have the opinion of all the members expressed. He strongly urged the necessity of prompt and united action of all qualified men in the State of New York and suggested a Committee be appointed by the Society to go to New York and Brooklyn to personally interview the Professional men there and try and get their hearty co-operation in our course. Also for the same committee to appoint two or three members of the committee to remain at Albany to urge the passage of our New Bill. Dr. Carnrite asked the chairman if the facts of how our milk, meat, and dairys were inspected, and the want of Veterinary Surgeons on all Boards of Health, was properly explained to the members of the Legislature last year. Dr. Morris answered that it had been thoroughly explained to them. Dr. H. Sutterby asked if it would not be better to ask the co-operation of all Local State Societies to use their influence in getting the proposed Bill passed. President Morris said that was his object in getting a committee to go to New York and Brooklyn, to have a personal interview with the Professional men and to get their views in this matter. Dr. Sidebottom asked for the present Law of registration which was read by the Secretary. Dr. Carnrite asked who was responsible for the present Law. President Morris answered that the present law was framed to put a stop to new unqualified practicing. And in time only qualified men would remain. But the Quacks had brought influence to bear and had the Act extended from year to year.

Dr. Jno. Wende wanted to know what was to prevent the present law from being extended again.

President Morris said that Governor Hill had said it was the last time he would sign the extension. Dr. H. Sutterby moved that proposed Act be printed and a copy placed in the hands of every member of our Society. Also a copy sent to every Veterinarian "Who was a graduate of a Veterinary College or University" in the State of New York. Also to have a fund subscribed by the members of the New York State Veterinary Medical Society to defray the expenses of a Committee to go to New York, Brooklyn and Albany, to assist in getting the new proposed act passed. The motion was seconded by Dr. Huff and carried.

Dr. H. Sutterby asked for the reading of certain sections of the Bill for the information of some members present who were somewhat in doubt. Dr. Bell asked how many would be needed to go to Albany and about how much money would be required. President Morris said one member would be sufficient. Dr. H. Sutterby said send three members. Dr. J. M. Chase said send two members. D. Darnrite thought there would be no objection to this proposed Act from the Public, but only from unqualified men and their friends Dr. Chase said that in his County there were three graduates and forty-two unqualified men. Dr. Drinkwater said he had talked with a few prominent unqualified men who said they proposed to ask for a clause in the New Bill to graduate the age of men to come before the Board

of Examiners those under the restricted age to be obliged to attend College and graduate before practicing. Dr. W. G. Dodds fully agreed with Dr. Drinkwater regarding the intentions of unqualified men. Dr. Sidebottom cited the English Law on Veterinary practice of qualified men, and Registered men having a right to practice as such.

Dr. Wende said that was just the law we have in New York State at present, the trouble was that the time allowed for registration being extended from year to year. Dr. Hinkley thinks we will have to go slow and get our laws and wants by degrees and to follow in the footsteps of our brother professional men the Medical Doctors, who had been trying a good many years before they had the present law enacted. Dr. Sutterby wanted individual petitions procured and sent to every member in the State. Dr. Gowland thought we must be careful and get the proposed Act into the hands of our friends only. Dr. Carnrite asked if Prof. Liautard assisted in framing the proposed law and if he was in favor of it. Dr. Morris thought that Prof. Liautard was always willing to aid in the passage of any law, or any movement that was made to promote the standing of the qualified Veterinarian and the profession at large, and was certain we could depend upon his assistance.

Several members discussed the feeling between the professional men of the East and West part of the State and all agreed that we should have, *No East, No West*, but one good organization, East and West combined, to protect ourselves. Dr. Carnrite said that even some of the qualified men were acting in company with Quackery, putting up proprietary Medicines and issuing Certificates of Practice to young men who pay them for them. He also stated that if the Public would only investigate they would see that the proposed Bill was more for the protection of the Public than ourselves. Dr. H. Sutterby's original motion was then put to a vote and carried.

Dr. Bell moved that President Morris and Prof. Law be appointed a committee of two to attend to the passage of the Bill at Albany and to try and get the assistance of Prof. Liautard and other prominent members of the profession to aid. Motion seconded by Dr. John Wende, and unanimously carried. A motion was then made and seconded to adjourn until 8 P. M. to allow members to get supper.

Evening Session, January 16th. Meeting called to order by President Morris, at 8 P. M. The discussion on Legislation was continued. Dr. Bell made a motion that President Morris be made a committee of one to call on members of the profession in New York and Brooklyn; motion was seconded by Prof. Law and carried by unanimous vote.

President Morris then called for the report of the Committee on By-Laws. The report was read by Secretary Hinkley stating that sections 10 and 11, also Code of Ethics and a list of all members had been added to the By-Laws. These were the only changes or additions made up to date. Report accepted and voted on, carried unanimously.

Report on Constitution called for. Owing to absence of the Chairman no report was made. Dr. H. Sutterby made motion to proceed to elect officers for ensuing year. Motion seconded by Dr. Drinkwater, voted on, and carried. The election of officers then took place and resulted as follows: President, Claude D. Morris, V. S., Bath; Vice-President, A. Drinkwater, V. S., Rochester; Secretary, Nelson P. Hinkley, D. V. S., Buffalo; Treasurer, W. D. Dodds, V. S., Canandaigua.

The following were elected a Board of Censors for ensuing year: John Wende, V. S., Buffalo; H. Sutterby, V. S., Batavia; John A. Bell, V. S., Watertown; G. H. Summerfeldt, V. S., Gouvenour; A. L. Hunter, V. S., Watkins.

Dr. Chase made motion, seconded by Dr. Duff, that an adjournment be taken until 9 A. M., January 17th., carried.

Meeting called to order 9 A. M., January 17th, by President Morris, who appointed the following committees to act during ensuing year. Committee on Arrangements: W. H. Carpenter, V. S., Johnstown; P. K. Sidebottom, V. S., Rochester; Geo. Gowland, V. S., Auburn. Committee on Publication: L. A. Robinson, V. S., Buffalo; H. S. Wende, V. S., Tonawanda; Wm. Kirk, V. S., Niagara Falls; E. A. Weiland, V. S., Buffalo; N. P. Hinkley, D. V. S., Buffalo. Committee on Legislation: Prof. James Law, Ithaca; N. P. Hinkley, D. V. S., Buffalo; C. D. Morris, V. S., Bath. Committee on By-Laws: Robert Somerville, V. S., Buffalo; J. M. Chase, V. S., Poplar Ridge; O. B. French, V. S., Honeoye Falls. Committee on Constitution: Frank Sutterby, V. S., Lyons; James Carnrite, V. S., Amsterdam; J. G. Hill, V. S., Sennett; M. M. Poucher, V. S., Oswego; Wilson Huff, V. S., Rome.

President Morris then called for the report of the Treasurer and appointed Drs. Chase and Sidebottom, an auditing committee. Report read and accepted by Auditing Committee. The report of the Secretary was then called for, read, and accepted. A motion was made and seconded that an assessment be made on each member, the amount raised to be used toward paying expenses of Legislation. A subscription list was also started and the members present contributed very handsomely, knowing the money raised is to be used for promoting the welfare of the Qualified Veterinarian and procure laws to protect the public at large.

President Morris then called upon Prof. James Law to read his paper.*

A discussion on Prof. Law's paper followed in which all members took an active part. Prof. Law explained how in making his searches and researches with the action of lymph "as prepared by Prof. Koch," and otherwise his subjects being the swine and thoroughbred cattle, both in England and in this country, he had proven that Prof. Koch's experiments were not the first on record.

Dr. A. Drinkwater, of Rochester, then read a paper on "Veterinary Examination as to Soundness of Horses."

A discussion followed in which it was decided by the members present that it was necessary that all qualified Practitioners of the State should adapt a form of Certificate to be given to the owner of horses examined for soundness.

Motion was made and seconded that an adjournment be taken until 2 P. M.; carried unanimously.

Meeting called to order at 2 P. M. Dr. Claude Morris read a paper on "Diseases of the Eye." A very lively discussion followed and several expressed their opinion as to the different modes of treatment in diseases of the eyes, and remedies used.

Dr. John A. Bell then read a paper on Ergotism. Dr. Bell's paper was fully discussed by all members present as was also his mode of treatment in Ergot Poisoning.

* Published in the February number of the JOURNAL.

President Morris then called on Dr. John Wende to read his paper. A discussion was entered into on Dr. Wende's paper by all members present and continued until a late hour. A motion was made and seconded that we tender a vote of thanks, and compliment the Essayists for the interest displayed in reading their papers for the benefit of the members and the able manner in which they had prepared them. Carried unanimously.

A motion was made and seconded to adjourn until the semi-annual meeting to be held in July, 1891. Subject to the call of the Secretary. Carried.

And thus closed one of the most interesting and enthusiastic meetings ever held by the New York State Veterinary Medical Society.

N. P. HINKLEY, *Secretary*.

REVIEWS.

THE MYOLOGY OF THE RAVEN. A GUIDE TO THE STUDY OF THE MUSCULAR SYSTEM IN BIRDS. By R. W. Shufeldt. Pages, 343. London and New York: Macmillan & Co. 1890.

The student of comparative anatomy, who has desired to acquaint himself with the myology of birds has heretofore been compelled to rely almost exclusively upon the articles by Selenka and Gadow in Bronn's Klassen und Ordnungen des Thier-Reichs and Furbringer's Untersuchungen zur Morphologie und Systematik der Vogel. These, excellent as they are, have possessed the disadvantage to English and American students of being in a foreign language and of being expensive. Therefore there is need of an English book upon this subject, and the writer of the volume before us cannot be accused of inflicting upon us a treatise for the existence of which there is no need. Let us inquire into the manner in which he has attempted to supply the admitted deficiency.

In the first place, what can be said of the author's wisdom in selecting the *corvidae* as the family of birds with which the student can familiarize himself with the muscular structure of birds in general? On this point the author writes in his preface as follows: "In choosing the Raven for our subject, it was done in view of the fact that it is a large representative of a very numerous and cosmopolitan family of birds, the corvidae; so that in almost any part of the world, a variety of birds becomes available whose muscular systems can be studied by the aid of the present volume. It is hardly necessary to add that crows of all descriptions, jays, orioles, and a host of others, all fall within this category. It has this advantage too for the teacher and the student at the biological laboratory; for the former can use as his subject the rarer and more advantageous specimens, as the ravens or crows, while the latter can confirm the instruction of the former, at home, upon any of the smaller varieties or the corvidae, such as the jays or rooks."

To the above given reasons might be added the fact that in the corvidae the muscles are well developed in proportion to the size of the birds.

The author properly, we think, decides against the adoption of a nomenclature founded upon the nerve supply of the muscle, because, as he states, the same muscle in different types of vertebrates is not always sup-

plied with the same nerve and this would lead to confusion especially to the young student, and moreover, the myology could not then be well studied without, at the same time, a thorough study of the neurology, a task which the student is not always competent to carry out successfully.

In giving an opinion concerning the merits of a book, the following points demand consideration: (1) The accuracy and exactness of the author's statements, (2) The arrangement of the matter, and (3) The suitability of the book to those who are supposed to need and use it. The reviewer has gone through this valuable contribution to comparative anatomy with some care and is glad to say that on the first of the above mentioned points, he has no criticism to offer. Dr. Shufeldt has shown himself master of the subject and deserves the thanks of all naturalists. Indeed, the work is one of which American Scientists have reason to be proud, and it seems out of place to make any criticism. Inaccuracies of statement have been diligently sought for, but with negative results. With full appreciation of the merits of the book the writer begs to offer the following suggestions to the author: The book is likely to be of most service to the independent student. Those pursuing a course of comparative anatomy under competent instructors in our best Universities will have at their command the valuable German works already referred to. This does not imply that to these also the present volume will be of no value. It will be of great service to these, but for them the quotation of page after page in the original German will be unnecessary. It would suffice to give references to Bronn and Eurbringer. To the independent student, however, the value of the book will be greatly enhanced, if the German quotations should in future editions be condensed and their sum and substance given in the English. Indeed, the value of the volume would not in any way be lessened by such a change. If the quotations are to be continued, let them be given in translation. It would be different were our author criticising the German authors. In such a case, the desire to exactly and fairly represent his opponents would justify the giving of the quotations in the original language. But this reason for the production of a polyglot volume does not exist.

A matter of minor importance is the arrangement or order of dissections. The reviewer would recommend his students not to begin with the dermal muscles. While some of these muscles in birds are well developed, others are found with difficulty, or not at all. This fact is well recognized and clearly stated by our author, but we would suggest a footnote advising the independent student to begin with the muscles of the chest and upper extremities and warning him that he must not expect to fully acquaint himself with the anatomy of the raven from the dissection of a single carcass. It is very perplexing and discouraging for the young enthusiastic student to find that the very first muscles which he attempts to study are not recognizable or are present with such variations as to cast grave doubts upon their identity. The dissection of the dermal muscles should be reserved for subsequent study, after the student has acquired the skill, care and judgment which can come only from long continued practical work.

In conclusion the reviewer wishes to reiterate the statement that the volume which he has the honor of introducing to the readers of this journal is worthy of its able, diligent author, and a credit to the scientific workers of this country.

V. C. VAUGHAN.

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MENINGITIS.*

BY J. C. MICHENER, M. D., V. S.

Since our last meeting, I received notice to prepare a paper upon Meningitis. According to Prof. Williams, this is a disease of rare occurrence, in veterinary practice; which coincides with my experience. But I took it for granted, that it was intended that I should take up the more fruitful theme known to our profession as Cerebro Spinal Meningitis, and to the non-professional, by such local names as Choking Distemper, Putrid Fever, Putrid Sore Throat, Paralysis, Falling Sickness, Corn stalk disease, and the Jersey disease, all of which nomenclature is defective inasmuch as it fails to denote either the pathology, or cause of the malady; the professional name being the worst of the whole lot. Even to-day I shall not venture a name for fear time will show it to need remodeling like the rest. Although we have very little literature upon the subject, and it is generally regarded as a new disease, it has been known, and dreaded, in our district by the oldest men and their predecessors. My father has been handling the disease the past fifty years and his preceptor had experience with it for a number of years before that.

It has such an extended range of symptoms, owing to the many different parts of the nervous system upon which it may concentrate its force, and the extreme variability in the severity

*Read before the Pennsylvania State Veterinary Medical Association March 3, 1891.

of the attack, that the practitioner must be well-versed in the whole line of symptoms and in differential diagnosis, or many cases will go unrecognized, and others will be allowed to advance to the last fatal stages before the gravity of the case is realized. Therefore, I trust, you will bear with me while giving the symptoms minutely, and we will then better understand each other in the discussion of the subject.

The general and first symptoms noticed are those of muscular paralysis, more or less complete and more or less slowly induced, according to the severity of the attack and varying considerably in the parts principally affected. This nervous depression seems to be a surrender of the vital principle, and the chemical changes of decomposition of death commence, and in protracted cases progress to the point of putrefaction while the animal is yet alive. We will first consider the worst type of the disease, then milder attacks, on down the grade, until it takes the keen practical observer to detect its existence.

I will narrate three cases as they occurred representing the disease in its greatest severity. Mr. Samuel Aaron, of Hillton, worked his three horses one day without noticing anything amiss, they ate as well and appeared as strong and active as usual. At four o'clock the next morning he was aroused by a thumping noise at the barn, and on going to the stable found a horse down flat on his side, and every few minutes striking violently with all four feet at once, making the splinters fly out of a strong partition. Procuring help the horse was dragged out of the stall, turned upon his breast, and strong efforts were made to get him upon his feet but he could not even hold his head up, and fell flat on his side the instant the helpers let loose their hold. Gearing one of his other horses he drove for me, the animal performing quite well. He turned back and I followed in a few minutes; after going three miles, I overtook my customer walking and leading his horse which was scarcely able to drag himself along, sweating and panting. We changed teams. I took the sick horse from the buggy and taking a short hold by the head, led him very carefully, bracing him at the shoulder, and urging him up whenever I felt his knees giving way. In about half an hour we accomplished the remaining mile and placed him at once in slings, as he was sweating profusely and trembling (*Substultus Tendinum*). The pulse was peculiar and characteristic, being rapid and intermitting, stopping entirely for an instant from time to time. After being rubbed and rested a few minutes the pulse dropped to thirty-two

missing about two beats after making ten or twelve, respiration natural. I had a bucket of water brought, the poor fellow was very anxious to drink, thrusting the nose deeply in and contracting the facial muscles and sterno maxillaris in a peculiar manner, as if determined to force some down, making a characteristic gulping sound, that would lead an inexperienced person to suppose he was drinking very fast, when in reality he was not getting a drop, but willing to persist in trying. The water being taken away and feed brought, he took some with the lips and vainly tried to work it up into the mouth, the saliva coming quite freely. The horse found down at four o'clock had by this time, seven o'clock, died.

We now directed our attention to the third horse, he had eaten his breakfast up clean, and the spectators pronounced him all right. I directed him brought out of the stable, he blundered over the door sill and fell down, unable to rise of himself but was gotten upon his feet by hand-help; a bucket of water was brought which he drank, taking him fully twice as long as it should, the water coming down the nostrils in streams the thickness of rye straws. The pulse, respiration, and temperature normal, eyes bright, and countenance cheerful. I tied his head up short and gave him hay which he chewed and swallowed slowly. Now we turned our attention to horse No. 2, he was hanging in the slings like a wet dish-cloth; let him down and he was dead by nine o'clock. The first sickened about six o'clock, the third and last horse fell and broke his halter at half-past nine and was dead by ten o'clock. Each horse died in three hours after being found sick. I have known a few others to die in from six to twelve hours and a great many to die in from twenty-four to thirty-six hours. When dying thus early they seem to do so quite easily, and unexpectedly to the attendants, but those cases that linger from four to five days on to two or three weeks, are apt to live many hours after they are expected to die. In many of the first named cases they die of nervous shock without leaving a single pathological change visible to the naked eye.

I will picture to your minds a stable of six horses having as many forms of the disease in question.

First, the typical case. He is noticed to be unable to work as usual, walks slower, sweats early and stubs his toes often. His gait is peculiar and diagnostic. The muscles have lost their accustomed elasticity, he does not pick his feet up as high as usual and gives them a rotary motion, planting them more beneath the

body, having more motion in the shoulders than natural. If it be fly time, he is greatly annoyed, he has lost the use of the *panniculus carnosus* and cannot shake the skin, he has not the full use of the tail and can only bring it partly around in a feeble way, wants to stop often and throw the head around at the flies, striking the body with the mouth, and leaving a wet spot on the hair from the saliva that is constantly dribbling from the mouth. This is very noticable when feeding upon grass, or a sticky mash, his sides being covered with green or mealy spots. His voice is very feeble, if it be a mare suckling a foal, it is painful to hear her attempting to call the colt unable to raise her voice above a faint call. In the stable the subject soon has the manger saturated with a thick ropy saliva, and pellets of hay that he has dropped, unable to swallow them. The manner of drinking or attempting to drink is diagnostic. The horse will persist in trying for a long while, keeping steadily at it, but getting his water very slowly, most of it returning back by the nose, never wincing, except occasionally he may stop and give a spasmodic cough as if choked, which is really the case; hence the name Choking Distemper. Usually, in from three to five days he goes down, flat on the side, unable to turn upon his breast without assistance, he soon becomes restless and attempts to get up but his head drops again with a heavy thud. Soon he has a great hole cut in the ground with his hoofs, striking violently with all four at once and always hitting the same spot, unable to get away from where he first spread himself out. Soon he has himself worn sore in many places. Run the hand in on top of the tongue, and when removed, it will have a sickening stench, hence the name putrid fever; coupled with the inability to swallow, it is sometimes called putrid sore throat; but there is never a trace of soreness or inflammation. The urine trickles from the bladder, hence the mare shows signs of oestrus from irritation of the clitoris. The fæces are voided in large masses with much effort, showing a weakening relaxed condition of the muscular walls of the intestines. Before the horse has gone down there will be noticed a rapid wasting of flesh, the abdomen is tucked up and the tendons standing out prominently. In the early stages of the disease if the pulse be taken, when at rest, it will be found normal or a little slower; but move or excite the patient and it becomes rapid and intermitting. There is great weakness. Temperature normal or low. In rare instances there is elevation of temperature in the last stages. After the patient has gone down, the lips retract showing the teeth, the tongue drops from the mouth and stays out.

The nostrils expand and the breathing becomes stertorous, the wings of the nostrils vibrate in a peculiar manner and tears roll from the eyes.

Along side of such a case we sometimes meet one that looks cheerful, eats and drinks well but shows weakness when put to work. He finely goes down exhibiting much the same symptoms as in the case first described; is raised with much difficulty and at first will make no effort to stand, but when fairly on his feet and well rubbed stands quite well and resumes feeding as before. While the animal is at rest, it takes an experienced person to detect anything wrong but while moving he will tumble down or tire out easily; a good type of the Jerseyman's "falling sickness," dying without showing any marked throat symptoms.

Again, in the next stall, we meet one that lies down and gets up, unaided to the last, but has almost complete paralysis of the tongue and muscles of deglutition, slowly developed, taking from a few hours to as many days to completely lose the power of swallowing. Such a case discharges much ropy saliva and the lining membrane of the œsophagus and trachea becomes putrid. The next horse shows weakness and in the course of a few days develops facial palsy; the lower lip hanging pendulous and drawn to one side while the nose is usually drawn in the opposite direction giving him a ludicrous appearance. This horse has difficulty in picking up his food but swallows fairly well, he may have other and more grave symptoms added, or gradually recover, with the facial palsy, the only very noticeable trouble.

We next find a horse standing with a leg flexed and trembling, like a man with a palsied arm. He lies down, gets up, and moves about and eats well, apparently only inconvenienced by his palsied member. He is apt to become more generally affected and have to be helped up, but stands a good chance of recovery.

Now over here by the door in a drier part of the stable stands the sixth horse apparently all right, but when put to work has somewhat of a stiff gait, gets tired out and sweats easily. He recovers without difficulty if removed to new quarters.

These cases may all be seen together, but the first and second ones are most frequently met with. When we have it only in one horse of a severe type, it is general paralysis, with the throat the most affected. When we have it in an enzootic form confined to a certain valley, low-lands or sea coast, it is of the second or spinal kind. Although going down flat on the side unable to turn up is a prominent symptom, at times we come across one that seems

conscious that the recumbent position is the worst and most rapidly fatal one he can assume, and who keeps upon his legs, sweating, panting, trembling and rocking to and fro, until the last thread of strength is severed and sinks down to die in a few minutes. Much has been said of the spasms that seize them while in this recumbent position. That is an error. They remain conscious to the last or until advanced dissolution benumbs the brain. When first going down, they rest well for a short time, then become uncomfortable and after a few ineffectual attempts to turn upon the sternum, become much distressed and alarmed; and the spells of violent kicking and striking are only efforts to get away from the spot to which they are so thoroughly pinned. When such a spell is coming on he has only to be turned upon the sternum and all is over. The pathology of this disease is a highly interesting study.

From what has been observed as to character of pulse and temperature, we should not find any products of inflammation. In some of the most rapidly fatal cases, I have been unable to find any alteration of structure whatever. In others of some twenty-four hours duration, there is a frothy exudation into the air passages and congestion of the lungs, which arises from being in the prostrate position and from the muscles of respiration being partly paralyzed. These appearances have led many to conclude that they died of pneumonia, but there is no alteration of form or structure in the lungs. Quite early there is an exudate into the meninges of the spinal cord of a pale yellow color and in some instances of severe attack it is nearly red; but *the membranes themselves are not inflamed*. I consider this exudate a product of vaso motor paralysis and not of cerebro spinal meningitis, a highly inflammatory affection. This exudate may become so extensive as to cause pressure, increasing the primary paralysis and hastening death. In cases lasting from three to five days their appearances are well marked; and in those lasting from nine to fourteen days we find mortification of the mucous membrane of the throat and upper air passages and it may be detached or corroded away, threads of the tissue floating in an aqueous fluid, emitting a very offensive odor. This condition decreases as we follow the air passages down into the lungs, but even here are found patches of gangrenous tissue, the walls of air cells breaking and causing emphysema. This putrid condition pervades the whole system the flesh being soft, and easily torn with the fingers.

Now in all of the symptoms and pathological appearances we

fail to find any evidence of an inflammatory affection; they all point to great prostration, paralysis and early dissolution. evidently the work of some depressent or poison to the nervous system. I wish the assignment to me of this subject had been deferred yet another summer and that I might have been able to give something more positive as to what the specific germ really is. I can only give theory and the reasons for the faith that it is a fungus, a mold, unlike other molds, in that it is poisonous to the Equine and Asinine species. Fungi grows upon dead and decaying organic bodies and on living plants. The mushroom and truffle are used as human food, while the toadstool, a first cousin, is a dangerous poison. Blight, mildew and rust are caused by a microscopic fungus and may not hurt a horse; while there is a kind that forms upon decaying vegetable matter *that kills* in the manner already described.

Several years ago I noticed that brewers grains when kept until spoiled would give horses this complaint. A good illustration occurred about eight years ago when two car loads, in this condition, were sold at Hatfield and Doylestown Stations. There were forty-two deaths (that came to my notice) within a week's time, in barns into which this grain went *and not a single case anywhere else*. It is not necessary that the horse eats them but only that they be stored in the barn where the maturing and bursting spores fill the air, with myriads of germs which attach to and grow upon the hay and feed, which the horses eat. Turnips stored with the tops on, and cabbage leaves will sometimes produce the same result. In practice I frequently have a single case in a stable from yankee mangers; with slatted bottoms and want of proper vent below, a collection of hay and dirt under the manger had become moist and was undergoing decay.

The three horses which died suddenly, had a mash of boiled rye the evening before, which was completely covered with a mold.

In the early autumn of 1879, Fredrick Hanson, a tenant farmer lost his whole stock of horses and mules, five in number, inside of three days. I found that his oats had undergone fermentation from being stored before properly cured. I told him that they undoubtedly gave his horses the "choking distemper" and that he should use the remainder for cow feed. After procuring another team he concluded to take a load of these oats to the Philadelphia market. They went into three different stables and killed seventeen horses, all that ate of them. So I was informed

by Hanson himself, who left the country from threatened prosecution.

In the fall of 1868 we had an enzootic of this disease, in a narrow valley, running east and west through Montgomery Township, starting at the head-waters and advancing steadily eastward about the fourth of a mile each day; driven by the prevailing west winds. It lasted two weeks and stopped short when the wind changed to the east. It was a mild form of the disease, eighty per cent. recovering. The larger half die on an average. It is a well established fact that horses of certain barns have this disease repeatedly while others in the same locality never have it. It usually occurs in damp barns and those in close proximity to meadows. Some of my clients have made alterations in and about their stables and afterwards escaped the dreaded malady. I have seen enough to thoroughly convince me that this disease originates from a species of fungus, and also that the microscope must furnish the aetiology. A healthy horse taken into an infected building for a short time, an hour or so, will contract the disease but a diseased one, taken into a healthy location will not carry infection, this fact suggests the most important point in treatment, namely, remove the patient to new quarters. Prevention is secured by avoiding the conditions that generate mold, and by discarding all food undergoing fermentation or putrefaction. The effects are best combatted by antiseptics and stimulants, internally and externally. I depend chiefly upon vinegar, chloride of sodium, camphor, capsicum, nux vomica, belladonna, mustard, good air, warm clothing and friction. It is also important to keep the patient upon his feet, except perhaps from a half to one hour daily, when the hoisting facilities are good.

TRACHEOTOMY AND LARYNGEAL INJECTIONS IN THE THROAT.

BY J. C. MEYERS, M. D., V. S.

Diseases of the throat described in every text book, and their frequent appearance in veterinary medicine must necessarily make the practitioner more or less familiar with their characteristics and gradations, therefore it would be, not only superfluous, but also improper, to consume the time by recapitulating the symptoms,

causes, and particularly, as in many of the ordinary cases, therapeutic interference, is not wanted. Last fall we had many opportunities to observe the last named form, as at one time the disease threatened to become enzootic. The milder sore throat cases, which were in the majority, suffered mostly from catarrhal pharyngitis, *Angina Pharyngitis*.

Among those affected with laryngo pharyngitis, several either took sick suddenly, or for which medical assistance was postponed until suffocation threatened to cut short existence; thus necessitating the operation of tracheotomy. For this purpose I prefer the trocar, invented by Prof. Hayne, of Vienna, especially when the acuteness of the case indicates a probability, that the tube will not be wanted any longer than a week or ten days, as in croup, purpura hemorrhagica (Blutflecken krankheit) cramp of the larynx, etc. The technical procedure with this trocar requires the least time, there is no loss of substance, and the cannula is not difficult to clean. The caliber, however, is too small to allow such an animal to work with. Prof. Vogel and Prof. Prosch are less favorably impressed by it, the former recommends Thompson's as the most suitable. Besides other objections they claim there is danger in operating with the Hayne instrument in that it is likely to pierce a jugular. I once thought to have met with such an accident, a short account of which may not be out of place.

One evening before sunset summons reached me to come to see a dray horse which just came in from work, whistling and roaring bad enough to suffocate if not relieved soon. Provided with the instrument in question I hurried to the place. Approaching the scene of trouble, I could distinctly hear the described noise notwithstanding the crowd collected around the animal. Drawing nearer I saw a well-nourished black horse, very uneasy, with an anxious look, pumping flanks, and foaming from mouth and nose. Under these circumstances I was obliged to operate without delay. I immediately grasped the trachea with the thumb index, and middle fingers of the left hand, about four inches below the larynx, pushing the sterno maxillary muscles a trifle backwards from their lateral position, giving the tracheotomy a passage free from all other tissues; the trachea was then pierced through from left to right in an exact transverse direction, with the instrument held in the right hand, so that the central opening in the tube remained in the middle of the windpipe. The stylet was taken out and the screws, (to make the cannula stationary) adjusted with allowance for some swelling. As the skin is the most sensitive tissue, it is

advisable to first make an incision through it with a knife, before the trocar enters. Usually upon withdrawal of the stylet air will follow. But alas! this time both openings discharged as much blood as their lumen would allow. The bystanders knew no better, but that I was bleeding the horse, which they thought was well done, but my enthusiasm was easily controlled; the thought that the opposite jugular might have been struck, appalled me; still I managed to keep calm, walked leisurely around to the other side of the horse, inspected the outlet of the tube and found my supposition erroneous, I gained courage; at the same time the hemorrhage diminished and in 1-2 to 3-4 minutes ceased entirely as also did the blowing and puffing. The cannula was removed, the patient allowed to go to his stall, when he commenced eating hay.

During a fit of coughing he expelled some blood clots mixed with slime; perhaps a false membrane. The owner informed me that on the same afternoon the horse had performed hard work, to which exertion I attributed the formation of a hæmatoma saccatum which the instrument must have penetrated producing the critical symptoms alluded to above. Four days after he was at work again. Now if the more popular operation, with excision of a suitable piece of the trachea is resorted to, the reconvalescence requires more time and as we all know, will not admit of a complete restoration, though it is seldom harmful. Should the nature of the case require an artificial opening for several weeks or longer, particularly if the animal is obliged to work, a tracheotomy tube of a later pattern, consisting of two parts, arranged and attached in such a manner as to attract but little attention is preferable.

Circumstances may compel us to deviate from the custom in the selection of a tube. Tumefaction of the neck at the outset, or the development of the same around the artificial opening, occasionally requires a change of the tube, in which case the operator must use his own judgment.

Recently I was called upon to treat another horse with roaring and difficult respiration. The driver told me that about two month's previous the horse had a similar attack of about thirty minutes duration. Since which time he evinced nothing wrong until now. As there was no swelling detectable around the neck or maxillary region, but repeated convulsive coughing, sweating and a frothy discharge from the nostrils, I presumed it must be "Spasmus Glottidis," an ailment known to me only through literature. Whether my diagnosis was correct or not, the symp-

toms indicated the operation which was performed, giving relief to the horse and all interested. The Hayne trocar was again chosen, expecting the horse would not need it any longer than a few days. Despite the original symptoms and anamnestic report indicating a spasmodic affection of the larynx I was obliged on the following day, to change my diagnosis to Glottis Oedemia, owing to the phenomena which developed through the night. All went well until the eleventh day when I plugged the openings of the tube, as I thought, sufficiently long to produce wheezing if the air passages were not clear, removed the cannula, cleaned it etc., but in eight or ten minutes after he commenced roaring again. My expectation not being realized, I felt obliged to insert another tube of a larger caliber, which served two weeks longer, when the horse seemed to be all right with the exception of the healing of the wound; whilst this was going on the horse received daily exercise without showing any deficiency. But we were destined to be disappointed, for in the first days hard work, it was found that his respiration was not yet normal. The proposition to send him to pasture for a few months, met with approval, from whence we receive most satisfactory reports.

The active participation taken by some of our most progressive surgeons in the laryngeal operation "Laryngotomy," recorded in the *American Veterinary Review*, leads us to believe that diseases of the throat are attracting more attention than heretofore.

Considering these facts a translation of an article on "Spasmus Glottidis," by Prof. Anancker in *Kochs Encyclopaedia der Thierheilkunde*, will undoubtedly be appreciated. It reads as follows :

"Spasms of the glottis, spasmus glottidis consists in tonic contractions of the lateral crico arytenoid, the inferior and superior thyro-arytenoid, and the transverse arytenoid muscles, secondly, also the muscles of the neck, as in asthma, the cause has been sought for in the reflex irritation of the nerves of the larynx, consequently the spasmodic attacks recur at uncertain intervals. As the glottis becomes contracted during glottis spasms it produces a dyspnoea attended with loud sounds during inspiration, therefore it was enumerated as one of the causes of roaring, but Gunther Senior, doubts this, as he did not see it set in upon intentionally irritating the upper laryngeal nerve. That such a spasm can be brought about is not to be questioned, at least, spasmodic cases in horses, have been observed. The spasmodic attacks recur some-

times daily, even while the horse is at work; connected with them are cough and suffocating spells, sometimes restlessness, anxiety, shivering, distended nostrils, rattling in the throat, stretching of the head, staring look, staggering movements and collapse; characteristic is the sudden abatement of the attacks. In the autopsy of a horse Degive found a cyst as large as a hen's egg filled with colloid matter, at the epiglottis, which on account of its position, could not close the glottis, but may have called forth reflex spasmodic contraction. To obviate threatened asphyxia, tracheotomy must be performed; repeated attacks of spasms must be alleviated by hot water inhalations, or a solution of Kali Bromid. as prescribed for asthma, and by tracheal injections of the same, or a solution of cocaine or morphia, toxic symptoms which may take place will disappear at once, upon inhaling several drops of nitrate of amyl (Anacker)."

As to therapeutic treatment. I am not in possession of any specific remedy, with which this manifold complicated ailment can be checked or influenced much. In benign cases, the owner, with the aid of his infallible neighbor, will, with few exceptions, help himself. The malignant or complicated cases must be treated according to circumstances. It would be difficult to give a formula which would hold good for even a few days.

There is, however, a discovery made known which is worth communicating to those who believe that nature tolerates support when rendered in a judicious manner and at the proper time. At a recent meeting of the German naturalists and physicians at Heidelberg, colleague Dr. Jelkman, of the section for Veterinary Medicine, reported on "Laryngo Pharyngitis of the Horse and its Cure by Laryngeal Injections of Prussic Acid," wherein he says: "Although the results in the treatment of inflammatory affections of the respiratory mucus membrane in coryza, adenitis, scalma, etc., were very unsatisfactory with the remedies employed so far, namely, to cut short the morbid process, fault must not be found with the physiological actions only, but also in the mode of application. As these agents are introduced mainly through the mouth it is impossible for them to come in direct contact with the affected mucus, and thus a local influence is almost excluded."

Local methods of treatment promised much better results, as through the examination of Prof. Dr. Schuetz it was proven that the diseases in question, nearly always in their primary stage, present a limited infectious inflammation of the surface of the mucous membrane. Again, the experiments of Prof. Dr. Dickerhoff, have

also shown that the local treatment of the respiratory mucosa is easily accomplished. Therefore if the proper remedy be found the result will be satisfactory, if the local treatment be adopted in time. Jelkman being guided by the above views made numerous experiments, and applied many expedients which were recommended, and others which had not yet been put to test. The first opportunity presented itself in a large transfer stable at Frankfurt, A. M., among horses affected with infectious laryngo-pharyngitis, a scalma enzootic.

Among 100 horses in an inclosure sixty took sick within six weeks, at intervals of one, two and four days. It being mid-summer those patients, six in number, which took sick in the first three days, were isolated, and placed in a large, roomy, well-ventilated hall. The internal treatment with the remedies known as promoters and regulators of morbid slime secretions, etc., was carried out from the first to the seventh day, but seemed to have no visible effect, nor did the externally applied derivants. The consequent laryngeal injections were made as an experiment. By this time the number of patients had increased to twelve. Laryngeal injections were administered to ten of these patients, each two receiving a different compound, for example, one consisted of sol. of alum acet., another of lugole's solution, another contained cocaine hydrochloric, and so on. The remaining two of the twelve were intrusted to physiatrice. This treatment was continued for four days without any apparent improvement, only in those having received the cocaine, it was noticed that the coughing irritation grew less soon after the injection, which, however, in a few hours recurred with the same violence. In those left without treatment the disease remained stationary. Taking into consideration the satisfactory results attained in human medicine by applying anodynes to the suffering tissues in inflammatory affections of the larynx and bronchial mucous membrane, an experiment was made with the following solution: morphia hydrochloric 2.0, aq. amygdalar amar. 200.0, 10 grms. of this solution was injected every morning and evening into the larynx of each of five other patients. The result was astonishing. The temperature which was 39.8 to 40.7 C., fell from the day of the first injection until the fifth, by which time the normal state was reached. The local appearances in the region of the oesophagus and mucous membrane of the larynx diminished in the same degree. The cough became loosened, less painful, the dysphagia disappeared and the appetite returned. The hyperplastic swellings of the maxillary glands also

dissolved. Of the twelve horses which took sick first and not treated after this manner, not one had recovered sufficiently to be able to perform the lightest work. While those which took sick eight or ten days later and were treated with aq. amygdalar amer. and morphia, were already at their usual work.

In the last two years Jelkman treated all laryngeal affections in horses with positive and speedy success as long as metastasis of the other organs did not set in. If the local inflammatory process of the mucous membrane was in the early stage of development, the disease could be cut short within two or three days, indeed be entirely cured.

If the disease had advanced further, a four to eight days treatment with injections was necessary. It is remarkable that in 200 patients the hyperplastic swellings of the sub-maxillary glands, diminished after the first injection, and in but three cases a slight imperfect abscess formed. After these results there is no doubt that the prussic acid contained in bitter almond water, with morphia, exercises a specific healing effect on the respiratory mucous membrane. Prof. Bing's established non-fermentation and anti putrefactive qualities of prussic acid supports such an opinion.

In the diseases in question, laryngeal injections are most effective. The head is lifted and stretched forward and the needle inserted in the so-called thyro-cricoid space. The contents of the syringe is then emptied under strong pressure. This pressure is absolutely necessary to the favorable result of the injection, for the diseased surface of the mucous membrane should not only be wetted but at the same time washed off. This washing off cannot be accomplished by the gentle inpouring of the fluid into the larynx. Unfavorable manifestations have never been noticed to follow upon injections being thus carried out. If it is inconvenient to inject twice per day, one injection of 20 grms. will suffice. When the weather is cold it is advisable to warm the fluid before injecting. Abscesses, that may form after injection will heal readily, when lanced in time and cautious antiseptic treatment is pursued.

EL DOURINE.*

 BY W. H. RIDGE, V. M. D.

Case.—Gray gelding, about 15.3 hands high ; weight, about 1,050 pounds ; six years old. Examined him, September 26, 1890. Found that the owner had bought him at a bazaar in Philadelphia a few days before. I saw that he had a peculiar attitude ; penis out part-way, which owner said occurred a great part of the time ; knuckled badly. Was extremely sensitive over the loins, almost lying down when pressed upon. Inside of legs were badly soiled with a discharge that came from the urethra. The mm of mouth was denuded in large patches, leaving angry ulcers, with vesicles covering the unbroken parts. The collection of masticated food had fermented, making foul smell to breath. Nostrils clear, rosy. In the centre of forehead I found a cicatrix which was depigmented. Around each upper eye-lid there was a scab which was easily detached, leaving a white scar. The mucous membrane was normal. The sub-maxillary lymphatic glands were enlarged, but not nodulated nor attached high up as in glanders. On taking the temperature, which was $100\frac{1}{2}^{\circ}$ F., I found large patches around the anus which were depigmented, leaving me with the idea that there had been ulcers there and they had cicatrized, as the one in forehead and eyes. No swellings as in melanosis. I found ulcers on penis and sheath, many patches were dry, scaling off, other places were discharging, the end of urethra swollen and discharging a sticky fluid which had soiled the inside of the thighs and legs. The owner said his appetite was ravenous. Noticed that he changed positions a great deal ; on motion, went something as if sore, but on closer observation, could see that it resembled loss of co-ordination (locomotor ataxia). Owner said there were parts that seemed to itch him, as he would nib and bite the skin. Could see no signs of recent castration.

My diagnosis at that time was variola, although we had a low temperature for an animal in this condition. I next saw him on October 3d, when I made a diagnosis of Dourine and requested a consultation at the Veterinary Department, Univ. of

* Case reported at the meeting of the Pennsylvania State Veterinary Medical Association, March 3rd.

Pa., to confirm my diagnosis—condition much the same except there are signs of paralysis of the hind parts, so much so that the owner said he was afraid to try to drive him, although his will, energy and appetite seemed all right—prescribed Pot. Iod. $\frac{3}{4}$ i; Fowlers Sol. $\frac{3}{4}$ iv; teaspoonful, t. i. d. Oct. 5th saw him again owner would not take him away. Temp. 100 pulse 45 Resp. 14, looks bright much the same, only find little elevations much like surfeit, on the skin. I ordered the mouth and sheath washed with borax solution.

Oct. 14. Found that many of the layity have made a positive diagnosis. Some persons having syphilis had urinated on some sore, giving the animal syphilis, I mention this point, as I find there are some who practice Veterinary Medicine that think such possible. I induced the owner to ship him to the Veterinary Dept. which he did to-day—one point that struck me was the change of the depigmented spots around the anus, without any ulcers forming, as some were nearly an inch from the primary spots.

Now the weather up to this time has been foggy, damp and warm, after sending we had a change to freezing, and clear, the animal appeared in the clinics on the 15th inst., when Dr. Zuill confirmed my diagnosis of El Dourine and put him on hygienic treatment without any internal remedies. Owner took him away, on Oct. 20 and came to me for some of the same medicine that Dr. Zuill had given the animal, as he was much better than any time before. But on his way home the owner fell in with someone who told him about the virtues of "life everlasting." I prescribed Quinine grs. ii, Ferri Sulph $\frac{3}{4}$ ss twice a day, with the understanding that he could give all the "life everlasting" he wished. I found that they had inoculated an old horse at the University Veterinary Hospital by means of a sponge, but with no result.

Oct. 23, I found the mouth nearly all healed leaving white spots, the sheath not so much soiled but nervous symptoms much the same.

I prescribed Quinine Sulph. and Ferri Sulph. in powders. Also gave, Fowlers Sol and Tr. Nux. Vom. equal parts, teaspoonful night and morning. Nov. 17. I drove the horse 7 miles, I could scarcely see any thing the matter, no ulcers, no discharge no ataxia, coat looked bright and seemed in good health. Owner seemed to attribute it all to "life everlasting," so I stopped my treatment. Dec. 7, he sent for me, the mouth much the same as

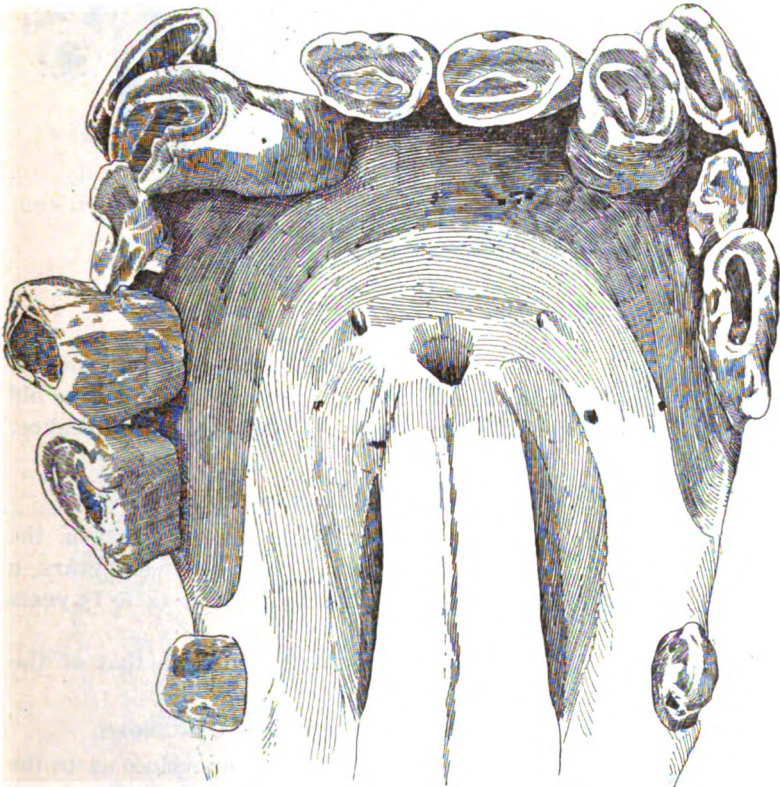
at first, urethra discharging, there is a sore over loins about the size of my hand. Prescribed Pot. Iod. and Fowlers Sol. when he began to improve, but yet to-day March 3d there is enough I think for any one to make a diagnosis.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VETERINARIAN.

[Continued from page 121.]

FIG. 61.



Figures 61, 62, show an upper jaw from the collection of Dr. J. W. Gadsden, of Philadelphia, in which will be seen—super-

numerary incisor; supernumerary intermediate teeth; corner teeth of first dentition still remaining.

FIG. 62.

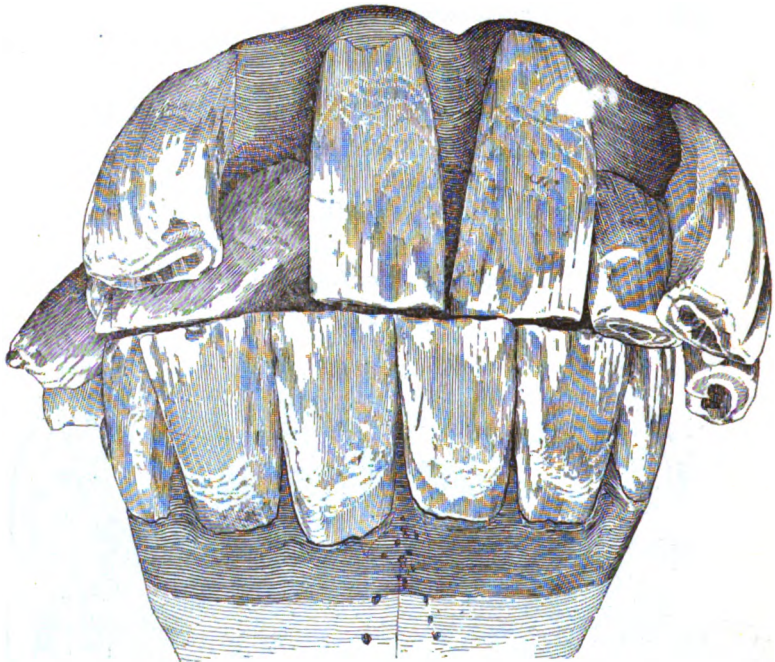


FIG. 63.



Figure 63 represents a sub-zygomatic molar, natural size, removed from a three months old gelding, by Dr. W. J. Martin, of Kankakee, Kansas.

IRREGULARITIES OF FORM.

In certain subjects the incisors of the lower jaw present, at the age of six years, a decided triangular form such as is usually seen at 14 to 15 years of age.

This triangularity is readily distinguished from that of the older age by the presence of the cup.

IRREGULARITIES BY UNITING OF TWO INCISORS.

This sort of irregularity has no special importance as to the determination of age, but is interesting as a curiosity. Figure 64 shows the upper jaw of a horse with a double left hand intermediate tooth, in which the two cups are perfectly distinct.

FIG. 64.



IRREGULARITIES IN FORM OF THE DENTAL CUP.—FISSURE.

Figure 65, 66. Fissure of the incisor teeth, by failure of the enamel on the posterior face, to completely surround them, is

FIG. 65.

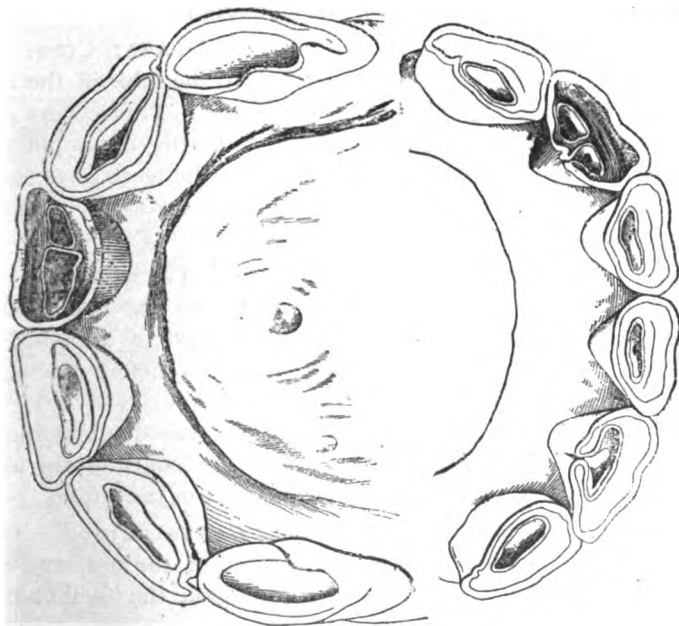
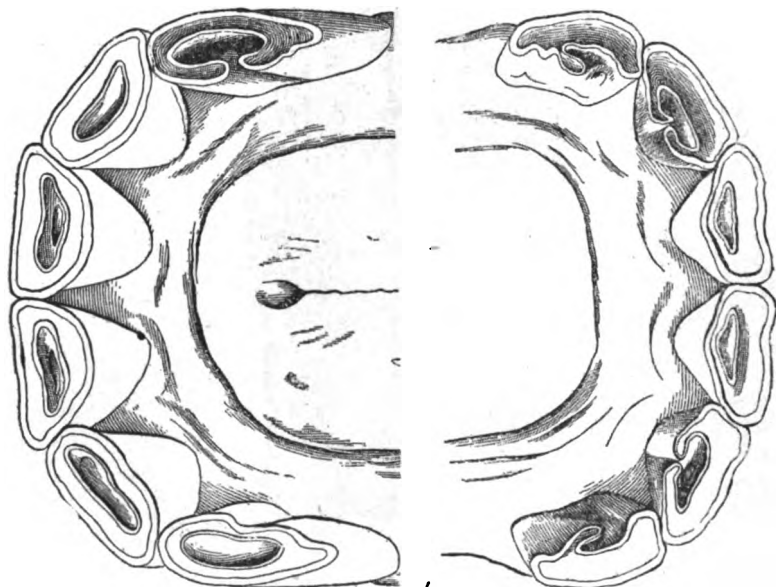


FIG. 66.



rather more common in asses and mules than in horses. The fissure may represent only a small portion of the tooth, or it may constitute a complete division of the posterior surface, leaving the peripheral enamel in the form of a crescent.

IRREGULARITIES IN DEPTH OF THE DENTAL CUPS.

Frequently the dental cup continues on the table of the teeth at a time when it should have disappeared. This occurs more frequently in very well-bred horses in which the development of the teeth has been precocious and in whom the teeth have such a consistency and hardness that they do not wear away by use, as in more common-bred horses.

EXCESS OF HARDNESS OF THE TEETH.

The nature of the food it has eaten and the condition of health of the teeth are all causes which tend to influence this irregularity. It is a condition rarely noticed before the age of seven or eight years..

The length of the teeth and the form of the dental tables, is less to be considered in estimating successive length of the teeth, than is the form of the dental tables and that of the cups.

EXCESS OF LENGTH OF THE DENTAL CUP.

Sometimes while the teeth have worn in the ordinary way, have diminished in length, and have undergone the usual changes

in the shape of their tables, the cups continue in size and shape, not corresponding with the other indications of age. In these an attentive examination of the tables of the incisors with their shape, the size of the dental star, its situation, the condition of the upper incisors, the direction of the teeth, their length, color, etc. will rectify the faults of the cups.

FIG. 67.

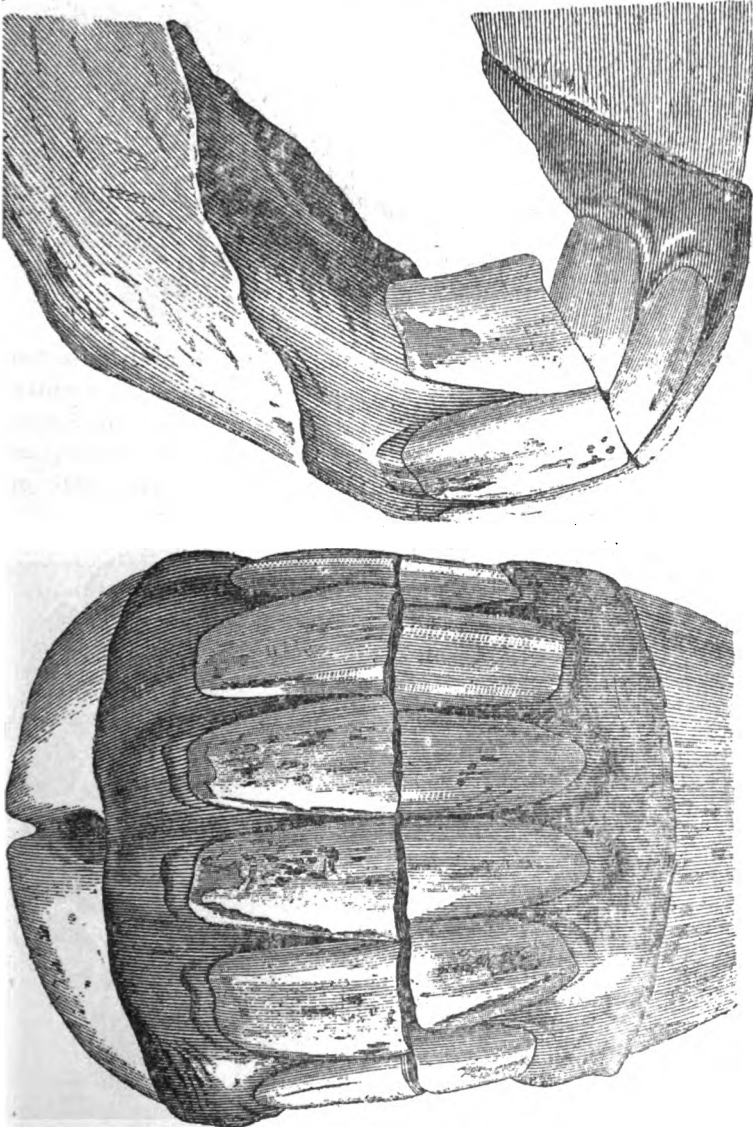


FIG. 67.

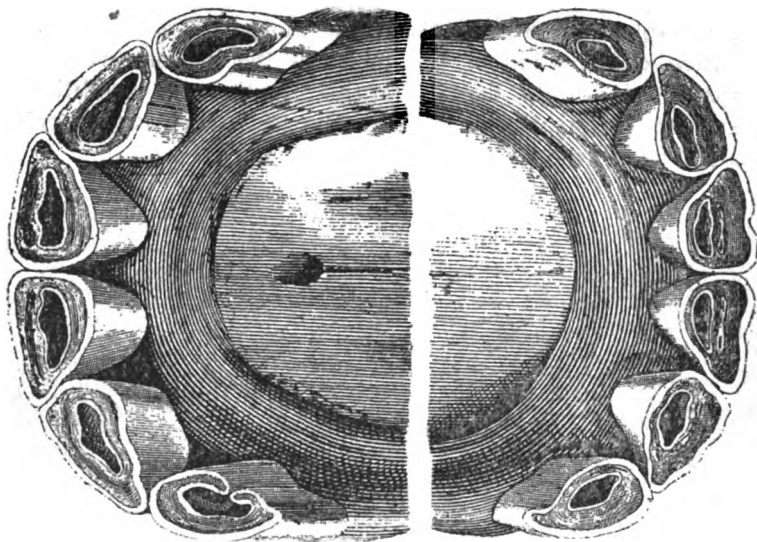
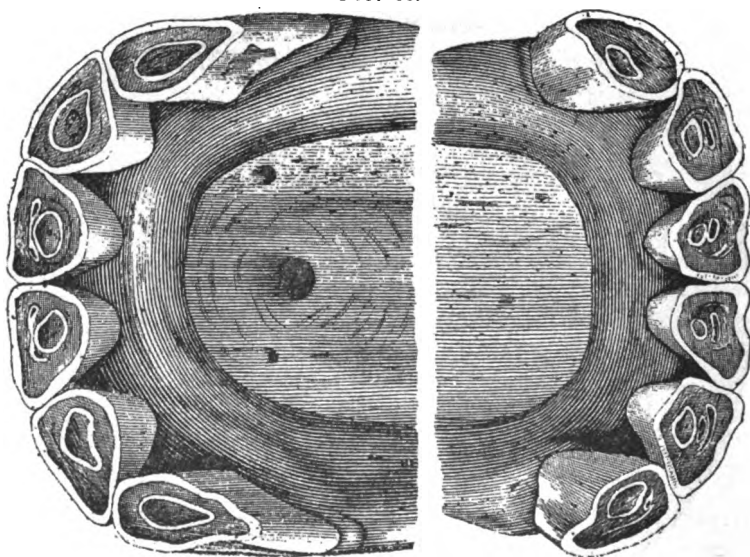


Figure 67. This plate represents the teeth of a horse nine years of age; the dental cups are of a size and shape representing a younger age. In Profile the mouth is that of a horse five or six years of age; the inferior tables are round, the central enamel are close to the posterior border of the teeth. The corner teeth are

FIG. 68.



levelled and rounded, the dental star is near the middle of the teeth. These characters added to the freshness of the corner teeth, the obliquity of the inferior incisors, the notch on the upper corners, and the general condition of the subject, are sufficient to rectify any error indicated by the first inspection.

FIG. 68.

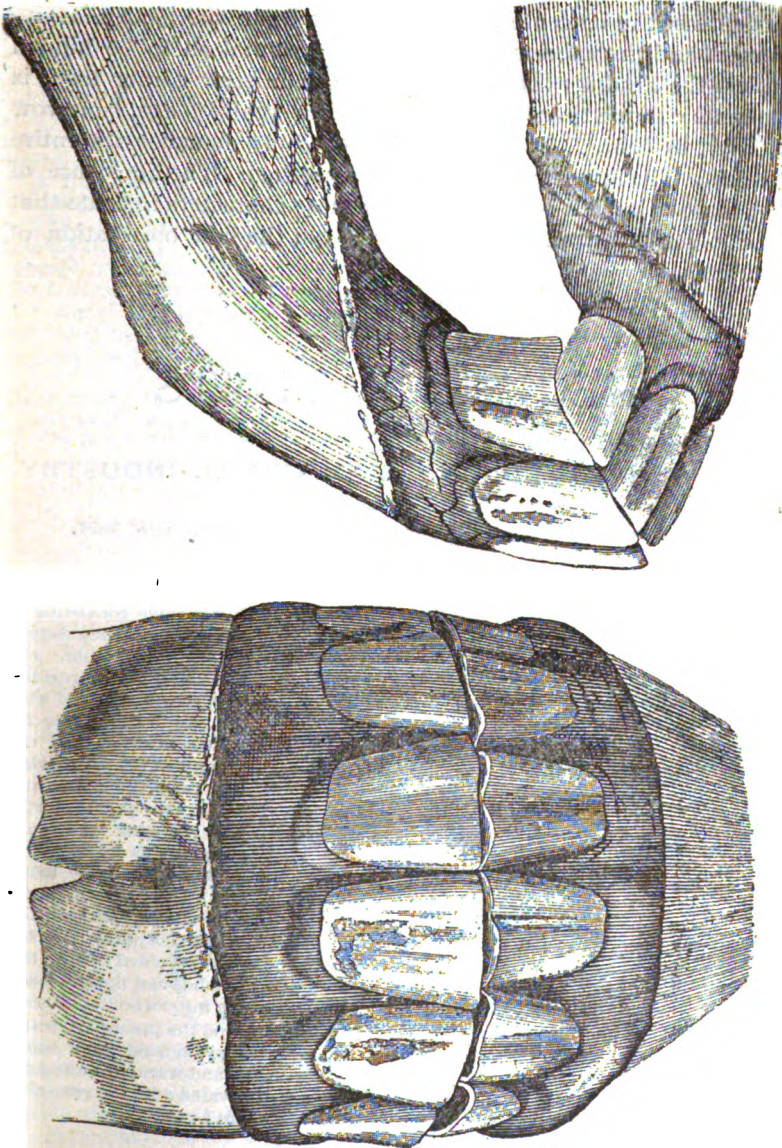


Figure 68. This figure is taken from the mouth of a horse fourteen years of age. The levelling of the teeth would only indicate about ten years of age but a close examination of the tables show : 1st, that the pincers are nearly triangular ; 2nd, the intermediate teeth commence to become so ; 3rd, the dental star is perfectly distinct, narrow and rounded; the inferior incisive arch is depressed in its center. Seen from in front, the teeth show no cement and the inferior teeth are so horizontal as to be hidden unless the head is raised. In profile the inferior corner tooth is no more oblique than that of a horse ten years of age, is narrow in front to behind, and has about the same diameter its entire length. The superior corner tooth is notched. The incidence of the incisive arches is acute. All of these characters indicate that it is older than would be supposed from the first observation of the teeth.

[TO BE CONTINUED.]

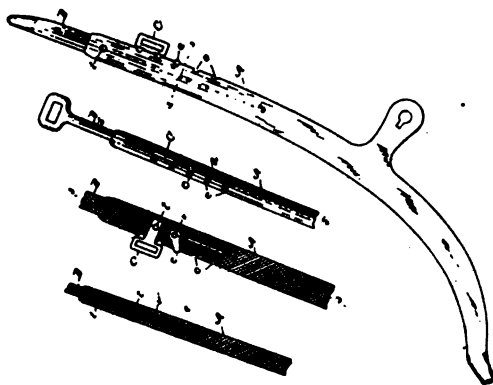
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month ending March 14th, 1891.

447,466. HAME. RALPH R. KRUHM, Vicksburg, Mich. Filed May 22, 1890. Serial No 352,696. (No model.)



Claim.—1. An adjustable hame consisting of the two parts, one sliding within the other, the outer part being provided with the notches and with the slot leading into its hollow interior, and the inner part being provided with the pivoted latch and being also provided with the rein-ring eye, substantially as set forth.

2. An adjustable hame comprising the two parts, one sliding within the other, the outer part being provided with the notches and the slot leading into its hollow interior

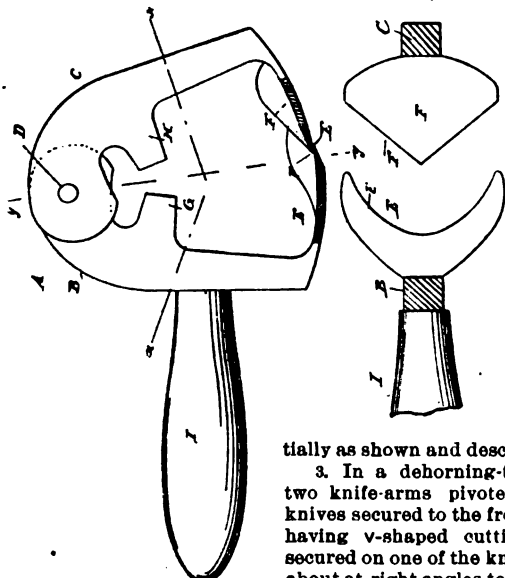
and with the pin-hole also leading into its hollow interior, and the inner part being provided with the latch attached thereto by a detachable pivot, said latch being extended out through a slot in the outer part of the hame and turned at an angle to engage the notches, and said inner part being also provided with the rein-ring eye attached thereto by a detachable pin, substantially as set forth.

Claim.—1. The combination, with a horse-shoe provided with a raised toe-plate B, having a flat bearing-face *b* below the body of the shoe, with projecting ribs *b1* formed on said face and separated by a central space *b2*, and heel-plates C, having flat bearing-faces *c* and projecting ribs *c1*, of a removable toe-calk D, provided with a flat bearing-face *d*, having flanges *D1*, adapted to rest against the bearing-face of the toe-plate between the projecting ribs of said plate, removable heel-calks J, provided with flat bearing-faces having lateral flanges and adapted to rest against the bearing-faces of the heel-plates between the projecting ribs of said plates, vertical studs or pins formed on both the toe and heel calks and engaging in sockets formed in the plates, and fastening-screws whereby the removable calks are secured to the raised plates, substantially as set forth.

2. The combination, with a horseshoe provided with a raised toe-plate B, having a flat bearing-face *b* below the body of the shoe, with projecting ribs *b1* formed on said face and vertical ribs *b2* formed on opposite ends of said toe-plate, of a removable toe-calk D, provided with a flat bearing-face *d*, having lateral flanges *d1* and adapted to rest against the bearing-face of the toe-plate between the projecting ribs *b1* of said plate, and vertical lips *h*, formed on opposite ends of said toe-calk and adapted to fit between the vertical ribs *b2*, formed on the ends of the toe-plate, and fastening-screws *i*, engaging in openings formed in the lips *h* and end walls of the toe-plate, substantially as set forth.



447,611. TOOL FOR DEHORNING CALVES. CHARLES T. LEECH, SAM. DWIGHT, assignor of one-half to Samuel W. Gammon, Chicago, Ill. Filed June 19, 1890. Serial No. 365,962. (No model.)



Claim.—1. In a de-horning-tool, the combination, with two knife-arms pivoted together at the top, of knives secured to the free ends of the said arms and having v-shaped cutting-edges, the v-shaped cutting-edges being reversely formed, substantially as shown and described.

2. In a dehorning-tool, the combination, with two knife-arms pivoted together at the top, of knives secured to the free ends of the said arms and having v-shaped cutting-edges, and stops formed on the said knife-arms to limit the closing movement of the said knives, substantially as shown and described.

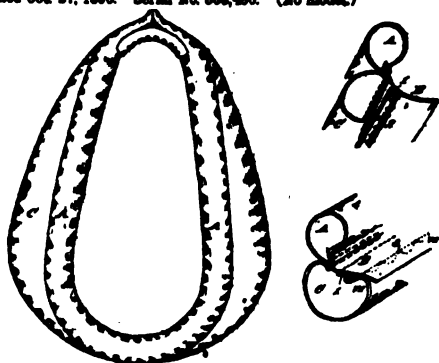
3. In a dehorning-tool, the combination, with two knife-arms pivoted together at the top, of knives secured to the free ends of the said arms and having v-shaped cutting edges, and a handle secured on one of the knife-arms and standing at or about at right angles to the same, substantially as shown and described.

4. In a dehorning-tool, the combination, with two knife-arms pivoted together at the top, of knives secured to the free ends of the said arms and having v-shaped cutting edges, a handle secured on one of the knife-arms and standing at or about at right angles to the same, and stops formed on the inner edges of the said knives, substantially as shown and described.

arms and arranged opposite each other, so as to limit the closing movement of the said knives, substantially as shown and described.

5. In a dehorning-tool, two oppositely-arranged dished knives having v-shaped cutting-edges, the v-shaped cutting-edges being reversely formed, substantially as shown and described.

447,649. HORSE-COLLAR. JOHN F. TRAUTMAN, St. Louis, Mo.
Filed Oct. 27, 1890. Serial No. 369,496. (No model.)



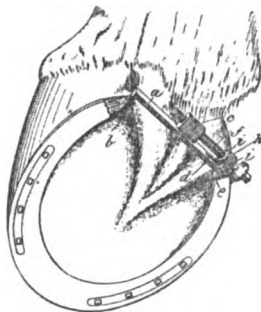
Claim.—1. In a horse-collar, the combination of the roll, facing and backing, the outer edge of the facing being connected to the backing and the outer edge of the backing being folded over the point of connection between it and the facing and being itself secured to the facing at a point remote from the edge of the latter, substantially as set forth.

2. In a horse-collar, the combination, with the roll, facing and backing, of a narrow strip secured

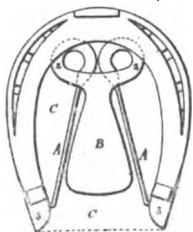
to the under or inner side of the backing and to which strip the outer edge of the facing is connected, the outer edge of the backing being folded over the point of connection between said strip and facing and being itself secured to the facing at a point remote from the edge of the latter, substantially as set forth.

Claim.—The combination, with the bar having the prong *b* at one end, the slot in the opposite end portion, and the screw-tapped lug on one side, of the movable prong having the notches for receiving the members of the slotted bar, and the notch in the end opposite the prong for the adjusting-screw, also the adjusting-screw, said screw having the collars embracing the sides of the moving prong, all substantially as described.

446,828. HOOF-EXPANDER. GEORGE T. CHAPMAN, White Plains, assignor of one-half to Wm. Harvey Merritt, New York, N. Y. Filed Mar. 19, 1890. Serial No. 344,454. (No model.)



446,471. HOOF-EXPANDER AND FROG-DEVELOPER FOR HORSES. DAVID ROSSER, JR., New York, N. Y. Filed July 2, 1890. Serial No. 316,327. (No model.)



Claim.—1. The combination, with the spring hoof-expander, of a frog-developer and protector

connected with and receiving its support from the hoof-expander, substantially as set forth.

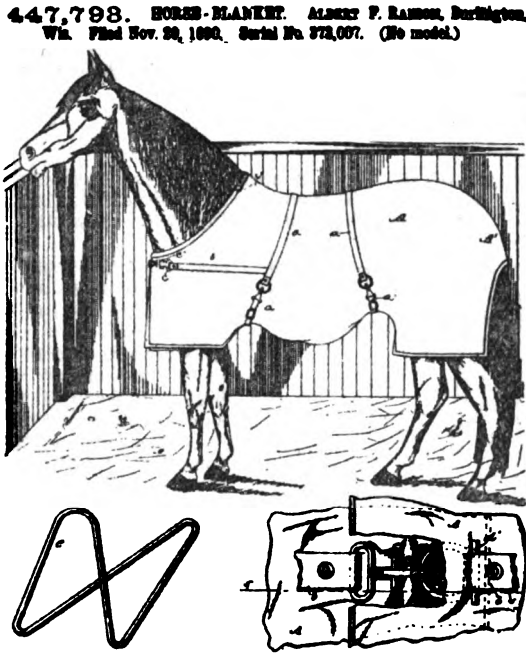
2. The combination, with the spring hoof-expander, of a frog-protector, connected at one end to the spring hoof-expander, and adapted to extend below the frog of the horse's hoof, substantially as set forth.

3. A spring hoof-expander and frog-developer formed of metal, the frog-developer being united with the coils at the ends of the springs forming the hoof-expander, substantially as set forth.

Claim.—1. The combination, with a horse blanket or cover provided with the bands or stays *a* of fabric, of the fabric breast-stays *b*, one having a snap-hook and the other a ring to be engaged by said hook, said ring and hook being each provided with a cross-bar to engage the said blanket or cover, and thus divide the strain between the latter and the said stays.

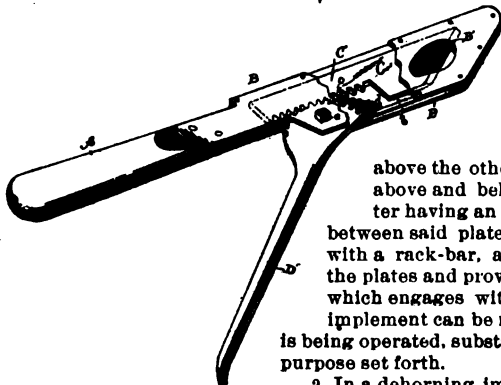
2. A horse blanket or cover provided at the upper side of its neck portion with a semi-rigid stiffening-frame *e*, stitched inside of the cover fabric and arranged to straddle the withers and hold the blanket or cover in place and prevent it from sawing back and forth, and thus wearing the mane.

3. A horse blanket or cover provided at the upper side of its neck portion with a semi-rigid stiffening-frame *e*, secured inside of the cover fabric and arranged to straddle the withers and hold the front end of the cover in place, the said cover having at its rear end an imperforate or non-open hood *A1*, of suitable length to extend down over the upper part of the animal's tail, and the said cover being open below the said hood portion to permit the animal to use his tail freely, as set forth.



48,092. IMPLEMENT FOR DEHORNING CATTLE. GEORGE H. STROY, Marcelina, Mo. Filed Nov. 29, 1890. Serial No. 372,066. (No model.)

Claim.—1. The combination, in an implement for dehorning cattle, of the plates *B B*, rigidly secured to a handle so as to be on a line therewith, said plates being connected to each other and provided with correspondingly-shaped openings *B1*, located one



above the other, so as to provide bearings above and below the cutter, a movable cutter having an inclined cutting-edge located between said plates and provided on one side with a rack-bar, and a lever pivoted between the plates and provided with a toothed portion which engages with the rack-bar, whereby the implement can be rigidly held while the cutter is being operated, substantially as shown, and for the purpose set forth.

2. In a dehorning implement, the combination of the handle *A*, plates *B B*, located one above the other and provided with oval aper-

tures, said plates being rigidly secured to each other and to the handle, a strip *b*, terminating so as to provide an opening through which the sliding cutter may be passed and a straight portion against which said sliding cutter bears, and a lever removably secured to the side pieces for operating the sliding cutter, substantially as shown, and for the purpose set forth.

447,919. CATTLE OR STOCK CAR. DAVIS L. SYLVESTER, Philadelphia, Pa., assignor to the Allison Manufacturing Company, of Pennsylvania. Filed May 2, 1889. Serial No. 306,341. (No model.)

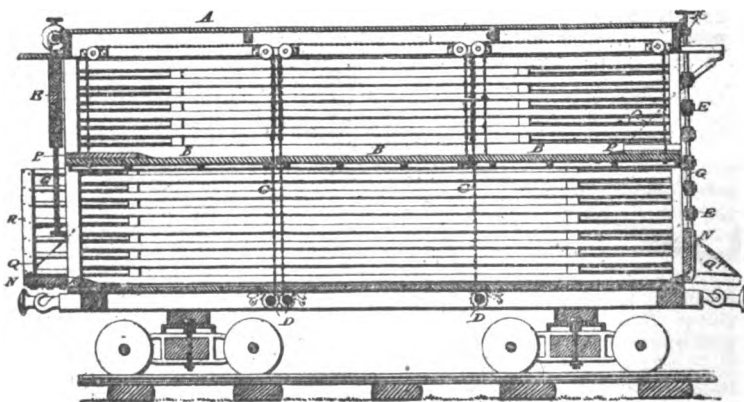
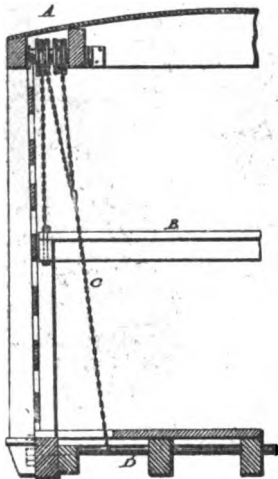
Claim.—1. A cattle or stock car having an additional floor composed of separate parts independent of the floor proper, bridges having ends adapted to rest on the said floors, mechanism for operating the floors, substantially as described, and sliding guards adapted to work in guides on the sides of the car and be projected longitudinally beyond the end of the car on each side of the bridges, and end blinds, said parts being combined substantially as described.

2. In a cattle-car, the combination of the blinds consisting of slats connected by the links or chains *L* and having ears at their ends, the guiding-rods *G*, and the chains *H*, connected to the lowest of the slats and to the drum *J*, mounted on the shaft *K*, said shaft being journaled in the car-body, substantially as described.

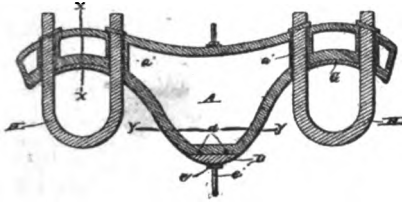
3. In a cattle or stock car having bridges in connection with the lower floor thereof, the sliding guards *R*, adapted to work in guides on the sides of the car and be projected longitudinally beyond the end of the car and on each side of the said bridges, substantially as described.

4. A cattle or stock car comprising a floor proper, a movable floor made in separate parts, bridges in connection with said floors, sliding guards at the ends of the car, adjustable end slats, and the operating mechanism for said parts, substantially as described.

in connection with said floors, sliding guards at the ends of the car, adjustable end slats, and the operating mechanism for said parts, substantially as described.



448,104. OX-YOKE. WILLIAM J. ACKERMAN, Malcom, Wis. Filed Dec. 10, 1890. Serial No. 374,312. (No model.)

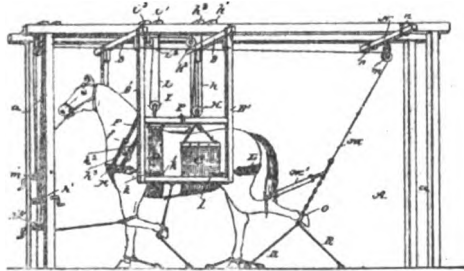


Claim.—1. A cast-metal yoke composed of a hollow stock having bow-openings, and having tabular extensions on the inner side of the stock in line with the bow-openings and extending flush with the top and the bottom sides of the stock, and having openings *g* in the top

side opposite the neck-cavity, and the zinc plates fitted to the neck-cavities and having their ends bent over the sides of stock into the said openings *g*, substantially as described.

2. The combination, with the hollow cast-metal stock having bow-openings, and having portions cut from the edges of the top side at *g* opposite the neck-cavities, of the bows *H* and the zinc plates lining the said neck-cavities of the stock and having their ends bent over the edges of the said stock, substantially as described.

Claim.—In the device 448,060. HORSESHOEING-RACK. SAMUEL M. MARTIN, Sidney, Ohio. Filed Aug. 14, 1890. Serial No. 362,026. (No model.)



herein shown and described, the combination, with a scaffold, of a supporting-rack suspended from the said scaffold and adapted to retain the animal, a transversely-shifting bar arranged at the top of the scaffold and to the rear of the rack, a pulley attached to said bar, and a rope passing over said pulley, adapted to be attached at one end to the hind leg of the animal, substantially as and for the purpose described.

PSEUDO-TUBERCULOSIS.

BY DR. A. W. CLEMENT.

Through the kindness of Dr. Ward, State Veterinarian, I had opportunity of making an autopsy, the record of which I herewith present.

Subject.—A Ewe, six years old, killed by bleeding for purpose of autopsy.

EXTERNAL APPEARANCES.—Body somewhat emaciated. Mucus membranes pale; otherwise normal. Skin normal. *Subcutaneous.*—Very little adipose tissue. Lymphatic glands normal. Mammaræ normal.

ABDOMEN.—Muscle pale. No fluid in cavity. Surface of

peritoneum smooth and glistening. No adhesions. Between the layers of the mesentery are several hard, circumscribed nodules, some of them the size of a pea; others five or six times as large. These nodules are scattered irregularly between the folds. On section they present a caseous centre surrounded by a fibrous capsule. The caseous material is mixed with calcareous particles. Beneath the visceral layer of peritoneum, especially beneath the portion covering the coil of large intestine are to be seen a large number of hard nodules, some circumscribed and the size of a pea, others confluent covering an area about the size of a silver quarter dollar. The surface of the nodules is rough and uneven. These nodules, on section, show a caseous centre mixed with calcareous particles, and a fibrous periphery; also none of the nodules examined are any entozoa to be seen. In the fold of the omentum is a nodule, dark red in color, smooth on surface, and not hard. On section, this nodule is seen to be a blood clot with a grayish central portion, about the size of a pin's head. There does not appear to be anything comparable to a wall surrounding this area. Close to this area, however, is a second nodule having the same external appearance but somewhat smaller than the first. On section there is a grayish central portion about the size of a pin's head, surrounded by a dark red area which is distinctly adherent to a fibrous wall. The inner surface of this wall is roughened where the contained clot is pulled off. This nodule ends abruptly but there appears to be a small vessel leading from it. The grayish, central portion, when examined under the microscope, is seen to be made up of fibrin fibrils. *Spleen*.—Surface smooth and glistening. The organ is normal in size and of normal, firm consistency. On section, bright red in color; pulp firm. *Pancreas*.—Surface smooth and glistening. On section, normal in consistency and color. *Liver*.—Surface smooth and glistening except at lower border of right lobe where just beneath Glisson's capsule is a nodule the size of a hickory nut. The surface of this nodule is rough and uneven. On section, it is calcareous throughout. The substance of the organ is firm and of normal brown color. The gall bladder is partly filled with dark-green bile. Portal veins empty. *Kidneys*.—Capsule easily detached, leaving surface of organ smooth. On section, this appeared normal. *Suprarenal Capsules*.—Normal on surface and on section. *Uterus* normal. *Bladder* empty. Mucus membrane smooth. Beneath the mucus membrane there are a considerable number of small, striated hemorrhages.

THORAX.—No fluid in cavity. No adhesion. *Pleural* surface smooth and glistening, so far as can be seen with the organs in situ. *Pericardium*.—About a tablespoonful of clear, straw-colored fluid in sack. Surface smooth and glistening. No adhesions. *Epicardium* smooth and glistening. No hemorrhages beneath this membrane. *Heart muscle* normal. Chambers empty. *Endocardium* normal. No sub-endocardiac hemorrhages. *Lungs*.—Crepitant throughout. Pleural surface smooth and glistening. Just beneath the pleura, more especially on the superior border of the lung are a great number of pin-head sized, semi-opaque bodies with a steel-gray periphery and a grayish-white, more opaque central portion. These bodies do not shell out. *Lymphatic glands* in medio-stinum normal. *Bronchial mucous membrane* smooth; and normal in color. No mucus in tubes and no strongylus.

THROAT AND MOUTH.—Organs normal.

BRAIN.—Dura mater adherent to skull cap. Pia mater smooth. Blood vessels not prominent. No fluid in ventricles; and glistening. Choroid plexus normal. Arteries at base of brain normal. Substance of brain normal.

SPINAL CORD not examined. The *tubercle* in lungs show, in traced preparation under the microscope; a small nematode worm corresponding to the grayish-white central portion. Further study of the entozoa and their possible or probable connection with the tubercle in the abdominal cavity deferred.

MARCH 5, 1891.

Upon further examination I find that the tubercles in the lungs were caused by the "*Strongylus ovis pulmonalis*." A good description of this parasite will be found in the "*Animal parasites of sheep*."—Bureau of Animal Industry, Washington, 1890.

EDITORIAL DEPARTMENT.

REVIEWS.

The object of these columns will be to review briefly the principle works published in various other languages on veterinary medicine and the sciences pertaining to it.

For the full development of a science nothing is so absolutely necessary as the dissemination of the "latest" ideas and discoveries. Daily we hear of "new treatments" which on examination are found to have existed years before. The experimentalist likewise often duplicates work and only because of an inadequate knowledge of the literature pertaining to the subject. Do not infer, however, that the above is intended to be an intimation that in the realm of veterinary literature there is an overproduction. In no science are "knacks" treated with so much secrecy as in veterinary medicine, and especially is this true of veterinary medicine in America.

It is the duty of every physician to observe and record the progress of every interesting case, to note the effects of a particular treatment and to give the results to the profession. In this way only can harmony be achieved in veterinary medicine.

One idea can be gotten of the important role that the recording and preservation of observations plays, when we recognize that with the destruction of all recorded facts the sciences would be plunged into a state parallel to that in which they were thousands of years ago.

The sciences and in fact all the pursuits and functions which together make higher civilization began with the recording and dissemination of observations; they would degenerate and finally cease if this were no longer practiced.

The reviews from German journals in the present number are from the pen of Leo. Breisacher, V. M. D., whose presence in Germany, at the great Veterinary centre of Berlin, assures us of his cognisance of the most recent work there.

KOCH'S LYMPH IN BOVINE TUBERCULOSIS.

It appears odd that with the great prevalence of tuberculosis in cattle, that no experiments should have been made, or at least have been reported in regard to the action of Koch's Lymph, in those animals affected with the disease. The Veterinary Department of the University of Pennsylvania has taken the lead in investigations of this character. A commission has been appointed consisting of a number of members of the Veterinary Faculty, which have been furnished with Koch's Lymph, and has been empowered to obtain tuberculous cattle. We will look with interest for its report to learn if this remedy will produce the same reaction in cattle as in man, and if it will have any value as a means of diagnosis, or as a therapeutic agent.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEO. BREISACHER, V. M. D.

DEGENERATION OF PERIPHERAL NERVES IN ANIMALS.

Dr. H. Hamburger.—He examined the nervi mediani and tibialis portici of horses, cattle and dogs, and found in some cases where death was caused by infectious diseases a degeneration similar to the degeneration found in the beri-beri of the human subject. *Monatschriftf. Thierheilkunde No. 11.*

THE DISINFECTON OF CATTLE CARS.

P. Canalis.—As the result of experiments of C. the following mode of disinfecting cattle cars has been adopted in Italy: After removal of straw, etc., from the car the walls are scraped with a large spatula especially devised for the purpose and then washed with a ten per cent. acid solution of sublimate—using a brush with stiff bristles—and finally irrigated with a sublimate solution of the same strength. The doors are left open until the walls have dried thoroughly. For every car about forty litres of solution are necessary—60 grammes sublimate, and 200 grammes muriatic acid. *Ibid.*

MOUTH SPECULUM FOR THE EXAMINATION AND OPERATION IN DOGS AND OTHER SMALL ANIMALS.

Prof. Leschner.—We know of no instrument whose absence in veterinary medicine was more felt than a mouth speculum for dogs and other small animals. Prof. L. has devised a speculum which seems to fill the want in every respect. It is manufactured by Ernst Borman, Vienna Rochusgasse 3. *Ibid.*

OSTEOMALACIA.

Vet. Winkler, of Grafenan.—Reports that in his district osteomalacia was almost entirely absent in 1889 while in other years this district, as is generally known in Germany, suffers a greater loss from this disease than from all other infectious diseases combined.

He attributes dry weather and an insufficient amount of phosphates and calcium as the principle causes. In former years when the fields and pastures were treated with the offal gotten from the potassium factories in the neighborhood of Grafenan, osteomalacia was unknown in that district. Winkler is of the opinion that in swine the chief cause of osteomalacia is the feeding of potatoes and sour milk. He disputes the idea of some "theorists" that lactic acid plays no role in the production of osteomalacia, and offers the results of several experiments on some fed with milk and sour milk in defense of his view. (It seems to us not at all impossible that the negative results obtained in relation to experimental production of osteomalacia are due mostly to outward circumstances which with care can be overcome.) *Wochenschrift f. Thierheilkunde in Viehzeucht No. 45.*

PHOSPHORESCENT PORK.

Vet. Gotteswinter.—Reports an interesting case of phosphorescence of fresh pork, the phosphorescence of the vertebrae was so intense that they resembled pieces of iron at white heat. Microscopically nothing abnormal could be noticed—a microscopic examination was not made. The meat was fed to a dog without any bad effects. About eighty pounds of the meat of the same swine were consumed by different individuals without the production of any effects whatever. In regard to the remarks which G. makes on the production of phosphorescence, etc., the editor of the *Wochenschrift* expresses himself as follows: Hersten who observed phosphorescence of pork thought a micro-organism was the cause. Wehenkel and Lahn failed to find an organism. Blanc examined phosphorescent horse meat and determined that the *light* appeared on the partially dried surface before decomposition sets in. In regard to the intensity, B. remarks that the phosphorescence of a piece of meat four inches square is sufficiently strong to make the hands of a watch discernible in a dark room. The duration of the phosphorescence is for horse meat 4—9 days, for beef 1—6, for rabbit meat 1—3 and for dog meat 1—2 days. According to B. phosphorescence is caused by an oval diplococcus (an organism to which the name *Micrococcus Pflügeri* has been given, has been described and has long been held to be the chief factor in the production of phosphorescence. Reviewer,) which develops in bouillon, urine and gelatine of either neutral alkaline or acid reaction. It does not produce phosphorescence of

the nutritive medium. Re-inoculated meat does not show phosphorescence however upon raw meat the organism produces its characteristic action. B. does not think that in the organism itself the phosphorescence is produced but upon the surface of the meat.

Neusch-Basel is of the opinion that the process in the production of *light* in bacteria, wood, plants and insects is identical in all cases with the *light* production of phosphorescence which consists of a slow combination of an organic body with oxygen of the atmosphere. This organic body is not identical with phosphorus. Through the "vital process" of animals and plants certain carbonaceous substances are produced which in combining with oxygen give rise to the *light* phenomena. *Wochenschrift f. Tierheilkunde* No. 46.

CHEMICAL TUBERCULIN.

Prof. Liebreich, of the University of Berlin, whose discovery of chloral hydrate first brought him into prominence and has given him a world-wide reputation, has discovered a chemical substance which is said to possess all the virtues of Koch's tuberculin. Unlike tuberculin it does not however produce fever nor endanger the life of the patient. Several recoveries of cases of tuberculosis of the larynx, as the result of the application of this substance, have been reported. L. will give the composition mode of preparation, etc., of this new substance at the next meeting of the Berliner Med. Geselloshaft.

SOCIETY PROCEEDINGS.

Illinois State Veterinary Medical Association.—The Illinois State Veterinary Medical Association held its regular semi-annual meeting, Feb. 25, at the Windsor Hotel, Bloomington. The meeting was called to order at 10 A. M., by President S. S. Baker, of Chicago, a quorum responded to roll call. The following gentlemen were in attendance during this meeting: Drs. Jas. Addison, S. S. Baker, J. W. Harwood, C. E. Hollingsworth, J. F. Ryan, C. E. Sayre, Jno. Scott, R. J. Withers, W. L. Williams, Jas. McClintock, Jas. T. Nathers, J. F. Pease, H. Thompson, A. G. Alverson, N. J. Stringer, M. Wilson and G. L. Crocker, (new member).

Several members elect were present but did not qualify.

The minutes were read and approved, after which correspondence was

heard from Prof. McIntosh regretting absence, and from Drs. Walker and Schoenleber regretting absence and sending their papers.

The corresponding secretary also reported correspondence with the Secretary of the U. S. Veterinary Medical Association in regard to its next meeting. The business report was read and placed on file. The committee on reprinting the Constitution and By-laws reported a rate of \$15.00 per hundred. Better figures were given by members outside the committee. On motion the subject was deferred and the committee held over.

The following new members were proposed: Drs. T. J. Gunning (Chicago '90), Neponset; Jno. Miller (Montreal '88), Dekalb; J. W. Parkinson (Chicago '90), El Paso; and N. P. Whitmore (Chicago '90), Gardner.

On motion the rules were suspended and they were unanimously elected to membership by acclamation.

On motion by Dr. Williams, seconded by Dr. Hollingsworth, the order of business was suspended and a committee appointed to revise the Constitution and By-laws and report at this meeting. The chair appointed Drs. Williams, Withers and Hollingsworth. Bills were then read to the society and ordered paid.

Dr. Wilson, of Nundota, then presented a well written paper on "Diseased Meats as Food for Human Consumption." Later researches have proven the identity of certain diseases of men and of animals. The Jews recognized the connection between diseased flesh and man's health. Their code of inspections clearly describes diseases well known now, and well described and named, and *Tuberculosis* is one of these. The Rabbi's were the medical men of the ancient Jews.

Everyone now concedes bovine and human tuberculosis to be identical. We can prove experimentally the transmission of tuberculosis from man to animals but not the converse; but children fed on the milk of scofulous cows die with tubercular meningitis.

Tubercular deposits are found in the lungs, external glands, and bone marrow, and the blood must distribute the germs to these parts. Hence if any signs of the disease are present the whole carcass is unfit for food.

Actinomycois is another disease that deserves attention. Deposits once thought to be tuberculous now are seen to be of this disease. The ray fungus is easily recognized microscopically, and turns out to be very common. Actinomycois of the bowels is known in human practice and is most probably the result of eating diseased meat. Cattle so affected are smuggled in and slaughtered and the beef sold to the poor, principally. This should be stopped.

Foot and mouth disease is a constitutional as well as a local affection, and unfits the flesh for use as food. In the "Dover outbreak" of 1884, well marked symptoms in the human subject were observed, produced by using the milk of animals sick with foot and mouth disease.

Anthrax and Trichinosis are plainly transmissible to man. But some diseases still remain, the transmissibility of which is not yet proven. Some microbes elaborate chemical poisons which produce the symptoms of disease. The disease may not be taken but the poisons are contained in the meat and make it unwholesome.

Discussion: Dr. Withers favors the inspection of all meat animals, both before and after slaughter; also the thorough inspection of milk and milk dairies. He favors the spaying of dairy cows as æstrum influences the quality of the milk. Dr. Williams favors strict inspection in the interest of the consumer and not of the producer. Cooking meat or boiling milk will destroy most micro-organisms but where the chief damage is done by *ptomaines*; this is not eliminated by heat.

In such cases the meat or milk should be condemned. Dr. Ryan described the inspection by Jewish officials and commended it as very thorough and highly satisfactory. The essayist spoke of a recent decision in Scotland regarding bovine tuberculosis. The *whole* carcase is now condemned if the disease is found to exist in it.

Dr. Thompson, of Paxton, then read a paper on "Fractures." He reported five cases of varying severity which recovered in slings, some with, and some without bandaging.

He always washes with the bi-chloride solution and dresses open wounds with absorbent cotton and iodoform.

Discussion: Dr. Williams puts some in slings and some he does not. With colts he prefers to put on a plaster bandage and turn them out. Question. "How do they get up and down?" Dr. Williams. "They soon learn to manage the stiffened limb." Dr. Nathers. "How do you put bandages on to stay, above the back?" Dr. Williams. "Strap with batting then with dry muslin bandages. Then stiffen the broken part with role leather splints, well washed in hot water, and cover with freshly wetted plaster bandages.

The society here adjourned until 2 P. M. On re-convening the discussion was resumed.

Dr. Withers uses slings as seldom as possible. Dr. McClintock mentioned a case of fractured humerus that was put in slings and made a good recovery. Dr. Scott has had several cases of fracture of the *os corona* and has used plaster casts and slings both with success. Dr. Withers has used the plaster casts in the cases and had good recoveries. On motion the rules were suspended and the following gentlemen proposed for membership: Drs. G. Z. Barnes (Ames '87), Pekin; and G. L. Crocker (Chicago '90), Springfield. Elected by acclamation.

Dr. Pease then read a paper on "Malaria in Horses." Three cases were reported showing more or less regular intermissions in the fever and in each case after the periodicity was noticed the above diagnosis was made and quinine was given.

It was successful in all of the cases and the essayist expressed himself in favor of large doses $\frac{3}{4}$ i to $\frac{3}{4}$ ii given so as to anticipate each paroxysm. The fever was promptly checked and convalescence progressed under a tonic as cinchonidia nux and iron. Arsenic was thought to have as good an affect as in the human subject. It proved a valuable adjuvant to the quinine. The symptoms in general were those of catarrhal fever, but without evidence of any accompanying catarrh; and the fever was intermittent and not continuous. Appetite capricious, evident headache, and later jaundice, were symptoms common.

Discussion: Dr. Sayre mentioned a case in his practice which was

probably malaria. Dr. S. S. Baker inquired if the essayist considered gr of quinine a large dose.

Ans.—"It proved large enough in these cases all which were in small or young animals. To a large horse I would give ss . and if this repeated, did not produce its desired effect would increase if necessary to gr .

Dr. R. G. Walker, of Chicago, being absent, his paper was read by the secretary. He reported a singular case seen by him as well as by Dr. Baker. It appeared like a bad case of tympanitis colic, but the horse continually strained as if to pass fæces. Examination per rectum revealed a large obstruction filling the pelvic cavity. On puncturing this, per rectum, a fetid fluid was drawn off the first time, and the next time a large quantity of pus. It was washed out with a carbolic acid solution. The swelling was gone, and fæces were passed, then the horse recovered.

The discussion which was lead by Dr. S. S. Baker, who had seen the case, took up the point of the cause of this pelvic abscess. Could it have been formed in the flank by a trocar puncture and the pus have gravitated backward and downward? It was generally thought not.

Dr. Schoenleber sent in a paper on the subject of "Our College Work too Limited." It was read by the secretary and was not discussed.

Dr. Sayre then read his essay on "Veterinary Dentistry." He quoted from the oldest work on veterinary dentistry known to him, a translation from the French, by Wm. Hope, in 1596.

This writer speaks of irregularities of teeth that need attention; also of the loss of a tooth allowing the opposite one to grow into the space. From this time there was little improvement in practical dentistry until C. P. Hanse learned to examine and operate without a speculum.

Mr. Hanse though a non-graduate was a skillful operator and did much for this branch of operative surgery. The country is now full of veterinary dentist's—self-styled—many of whom do more harm than good. They have, however, drawn the attention of the public to the fact that animals suffer from their teeth oftentimes.

But we want *Veterinarians*, not *Veterinary Dentists*. There are too few operations possible to horse teeth, to make it profitable to specialize. Beside irregularities and caries, horses suffer often from Peridentitis or inflammation of the peridental membrane. It may be acute or chronic, local or general. The causes are, death of the pulp from fractures, etc., and collecting of food between the molars where it decomposes. Results alveolar abscess or exostosis on the fang. (Specimens were shown.) The fifth lower molar is most often affected. Diagnosed, by pain in mastication, and the gum receding from the tooth, and the tooth may be loose or there may be pus.

Treatment. Tr. Aconite, and Tr. Iodine equal parts applied to the gum, and a poultice to the face over the tooth.

Discussion: Dr. Williams drew attention to the fact that caries, does not start, as a rule, on the table surfaces of teeth. The hollow spaces in the ends of the teeth of old horses are due to the entire wearing out of the enamel at that place. Malformations occur in which there is no dentine formed between a given two layers of enamel in the molars. This causes splitting of the teeth and caries starts from this cause. Ques. "Do the in-

cisors ever get too long?" Dr. Sayre.—Sometimes, and especially after much trimming of the molars, the latter do not touch without too much lateral motion of the jaws. When the mouth is in a state of repose, the molars do not touch together, in the normal mouth. Ques. "What causes chisel-shaped teeth?" Ans. There is too much difference between the width of the upper and lower jaws.

The obliquity of the table surfaces increases until lateral motion is first retarded and then prevented. The teeth being cut off until lateral motion is possible, they improve for a time but the deformity of the jaws remains and the teeth gradually get into the same shape again.

There are cases where this is, (unilateral form as I think) partial paralysis of some of the muscles of mastication, the jaw being drawn to one side.

The committee on Constitution and By-laws reported by their chairman Dr. Williams. He read the amendments proposed and moved that they receive the sanction of the association and be laid over to the next meeting for adoption. Seconded by Dr. Withers.

After some discussion it was decided, on motion by Dr. Ryan, seconded by Dr. Scott, to amend the proposed amendment to the By-laws, by adding a clause to the code of ethics, prohibiting the offering of gratuitous advice and recipes through the veterinary columns of agricultural and other non-professional journals.

The proposed amendments, as amended, were then given the unanimous sanction of the association, and will be acted on finally at the next meeting.

In order that the members of the association might become familiar with these proposed amendment, before the November meeting, it was moved and seconded that the Constitution and By-laws, as altered by the proposed amendments, be printed in pamphlet form for distribution to all the members of the association.

It was suggested that a list of the officers' of the association from its organization to the present time, be included in this reprint together with the roll of membership. Dr. Williams included this in his motion, approved by his second. The motion was carried, and the matter of reprinting referred to the committee appointed at the last meeting for that purpose.

Thanks for the use of the hotel parlors were voted to the proprietor of the house, and Dr. Williams was appointed to convey them.

The association then adjourned to meet in Chicago in November.

J. F. PEASE,

Recording Secretary.

The Pennsylvania State Veterinary Medical Association. The Annual meeting of the Pennsylvania State Veterinary Medical Association was held at the College of Physicians, Philadelphia March, 3, 1891. President W. S. Kooker, in the chair. The following members were present: Drs. Francis Bridge, Philadelphia; J. C. Foelker, Allentown; H. F. George, Greencastle; Robt. Gladfelter, Philadelphia; S. S. J. Harger, Philadelphia; J. R. Hart, Philadelphia; W. H. Hoskins, Philadelphia; R. S. Huidekoper, Philadel-

phia; W. H. Knight, Kennett Square; W. S. Kooker, Philadelphia; J. Z. Tintsmann, Philadelphia; L. O. Lusson, Philadelphia; Geo. Magee, Uniontown; G. B. Rayner, Philadelphia; Thos. B. Rayner, Philadelphia; Jno. B. Rayner, Branchtown; W. E. Reinhart, Steelton; W. H. Ridge, Trevoise; Chas. Schaufler, Philadelphia; D. C. Stanton, Factoryville; J. H. Timberman, Wilkesbarre; R. G. Webster, Media; W. L. Zuill, Philadelphia.

The reading of the minutes, owing to the absence of the secretary were dispensed with.

The following were nominated for officers for the ensuing year :

President, W. S. Kooker; first Vice-President, Thomas B. Rayner; second Vice-President, R. G. Webster; third Vice-President, Charles T. Goentner; Corresponding Secretary, Robert Gladfelter; Recording Secretary, Louis Olry Lusson; Treasurer, John B. Hart; Board of Trustees R. S. Huidekoper, W. H. Hoskins, T. B. Rayner, S. E. Weber, and R. H. Gladfelter.

The rules were dispensed with and the secretary was ordered to cast ballot for above officers, who were declared elected.

The following gentlemen were proposed for membership : Drs. Sturge, Koons, and Dubois, of Wilkesbarre.

Prof. Andrew Smith, of the Ontario Veterinary College, for Honorary Member, by Dr. Sallade. These names were referred to the Board of Trustees. A recess was then taken for a meeting of the Board; in the absence of two of the members, the president appointed Drs. Rayner and Webster, as temporary members.

When the meeting was reconvened the Board of Trustees reported favorably the names of Drs. Sturge, Koons, and Dubois, who were elected. The name of Dr. Andrew Smith, in the absence of Dr. Sallade was obliged to be postponed until the next meeting.

The following resolution which had been presented by Dr. Hoskins was recommended by the Board to the Association.

Whereas, we, the members of the Pennsylvania State Veterinary Medical Association feel a great interest in the advancement of veterinary education as a means of promoting the good standing of our profession; the improvement of our own members, and our future successors in the profession, and,

Whereas, we believe that a public institution, held in trust for the good of the community, should be so conducted as to be of the greatest advantage to the community at large :

We do hereby resolve :

That all public institutions and hospitals, which have received aid in lands and moneys, from the City and State government, should furnish free treatment to persons who from indigent circumstances, or from proper reasons are deserving of such, and, we further believe that a judicious exercise of this principle and the granting of free treatment to the animals of the proper persons is a boon to the community and can be made of inestimable value in the teaching and education of students.

Bul, whereas,

The Board of Managers of the Hospital of the Veterinary Department

of the University of Pennsylvania have altered the past method of giving free treatment to animals of proper owners, and have announced free treatment of animals of *all* owners, irrespective of their means, who appeal for such, and have advertised the same through the public newspapers, and in connection with this have made a business of selling medicine, at full rates and value, in which there is no charity;

Be it hereby resolved; that such method is not to the advantage of the community, to the profession, or to the students who are intrusted to said hospital for education.

Be it further resolved; that we consider this course of the Managers of the said hospital to be prejudicial to the country's good, prejudicial to the benefit of the veterinary profession, and prejudicial to the advancement of their students, and we hereby express our regret at, and censure of their action.

The report of the Board was received and unanimously approved.

Dr. Zuill, Chairman, Committee on Sanitary Science and Police, asked to offer a verbal report, as he had found it difficult to obtain sufficient answers on the subject, from those with whom he had corresponded, to make a satisfactory one in writing. He reported that the State is free of contagious pleuro-pneumonia. Tuberculosis prevails to a great extent, and will probably increase until the legislature passes a law by which it may be properly handled. Farcy and glanders are still prevalent.

Dr. Hoskins asked if Dr. Zuill meant acute or chronic pleuro-pneumonia. Dr. Zuill answered that he had no knowledge of *any* pleuro-pneumonia in the State. The report of the committee was accepted.

Dr. Hoskins, Chairman of the Committee of Legislation made the following report :

Mr. President and Gentlemen :

As chairman of your Committee on Legislation I have but a brief report to make for the past six months. You will recall the suggestions made at Lancaster, that our future hope then seemed centered in such amendments to our act, as would cover the points involved in the cases we had tried and lost. To this end we have bent our efforts with the following result.

Conferring with our attorneys, Messrs. Magill and Alexander as to such changes in our bill as would cover the apparent deficiencies, they at once set to work and after some three weeks of daily consideration and consultation of all authorities on contested points of the medical act, after which our own law was largely fashioned, they reported their inability to add anything to the law at this day, that would strengthen it in anyway. They believe the law fully covers every contingency that we need and could acquire and further states the decision in Northampton County, that the six month's clause was unconstitutional, has been decided otherwise by the Supreme Court of this State, in the test case made by the physicians; they further aver, that we would have won that case in the Supreme Court, had we appealed the same. They believe that any violation of the act may be reached, and so firm is their belief on this point, that they are willing to try any case of false, post-registration, and should they lose, they would not charge one cent for their services. No amendments offered to-day could be retroactive

and our only hope lies in individual action against those who have violated the act. Our hopes in this action was greatly strengthened in the decision of the Judge of Lancaster County, who pointed out the powers of our act in this direction. In this county during the past six month's there has been no registrations save those of graduates. On our records have there stood but two post-registrations of non-graduates, both by order of the court, one of which has since withdrawn from active practice. Throughout the State, as far as known, registrations save those of qualified men have ceased, and many have been denied this privilege by those entrusted with the fulfillment of the requirements of our act.

The mature decision of our attorneys assures us of the strength of our act, and I would recommend a trial or two of flagrant violators of the act during the coming six months, and if necessary, a final decision of the Supreme Court of our State. I likewise deem it important that we should test completely the legality of the decision, that Castration is not a branch of Veterinary Surgery. This question involves a principle that it is our bounden duty to sustain, for in the same category may fall Dentistry and it will only require a little stretching to place Veterinary Chiropody beyond the bounds of our law and the blundering, ignorant blacksmith, may ride above the law in perfect safety.

On the whole I take a sanguine view of the wholesome effect of our law. It has placed a barrier strong enough, I think, to defy breaking down at the border lines of our State, North, East, South and West. I know of no case in this county where a single violation has occurred, through the entrance from another State of any non-graduate. I am informed of several unsuccessful attempts, and in making this statement, I am reliably informed from every section of Philadelphia County. This gain is much, and promises much for the future veterinarian. We are left then to deal solely with those violators within our own border, and I trust that ere another six month's roll by we will have additional legal light shed upon our law, and thus be better entrenched for future action. Respectfully submitted,

W. HORACE HOSKINS, *Chairman*.

Dr. Hoskins added.

"We should decide whether castration was a branch of veterinary surgery, and that the incoming committee should forcibly act upon this subject. Some expense had been incurred by this committee through their attorneys, Mr. J. G. Johnson and Mr. F. Magill, and Dr. Huidekoper said that Mr. Johnson offered his services gratis. A vote of thanks was extended to Mr. Johnson. It was moved and seconded that the above report be accepted."

Report of the Committee on Intelligence and Education.—Mr. President: This committee having made a full report upon its subject at the last meeting of the association in September last, finds but little to add to it. The local associations of the State, at Philadelphia, in Franklin County, and that of the north western part of the State, held in conjunction with members of Ohio and New York States, have held regular and interesting meetings. We fear that no very active work has been done since our last meeting to stimulate the formation of new local societies, although we hear of two or

three that are on the way to organization; we think it would be well to have a thorough investigation of the wordings of the codes of ethics and when any such code is adopted, it should treat in a perfectly distinct way, of general principles only, and not be complicated with details, which can be made the basis for quibbling and waste of time on the part of those who wish to make trouble. Let the association be jealous of their membership and careful to the last degree in the character of those who they receive into membership, and there will then be less ground for charges and disputes

We can learn of no changes of importance in the curriculum of the veterinary schools.

The publication of *THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES*, has been removed from Philadelphia to New York, as a matter of greater convenience to its editors, but its pages will continue, as they have been, freely open to the pens of the Veterinarians of Pennsylvania.

The meeting of the United States Veterinary Medical Association, held at Chicago, proved to be the greatest meeting, in both the numbers that attended and in this scientific character of the papers and reports presented, that has ever been held in this country. It certainly furnished a great stimulant to the organizations throughout the country and we are glad to see that the new associations are organizing with a view to become an elementary part of the national association.

The present meeting at the College of Physicians at Philadelphia, the building of the greatest medical society in the United States, is we consider, an important step in the public recognition which it gives to the veterinary profession as a component part of the great science of medicine.

We recommend that the Readings of this Association, including essays and reports of committees be published in pamphlet form, not only for the members, but for circulation to reputable practitioners throughout the State. We beg to call your attention to the organization of an association of dairy-men which has been achieved by Dr. Sallade. It meets once a month. Some of the objects in view are: 1st. Mutual protection to its members. All animals are branded. 2d. The purification of meat, milk and other dairy products. 3d. To educate and create friendly feelings towards each other and to the veterinary profession in particular. Insurance of animals is carried on. All animals are appraised after death. Over \$800 has been paid to owners for losses sustained from tuberculosis and other causes. A yearly picnic and ball of the "Bovine Association," aids its funds. The Veterinarian receives a yearly salary as lecturer to the association. The result has been a very friendly feeling in the County towards the veterinary profession. Very respectfully submitted,

RUSH S. HUIDEKOPER, *Chairman.*

H. G. PAGAT.

JAMES A. SALLADE.

Dr. Hoskins announced that the next annual meeting of the United States Veterinary Medical Association would be held in September, at Washington, D. C., and further urged that as many as possible would join the United States Association.

Dr. William L. Zuill then read a paper on "Indigestion in the Horse, Gastric and Intestinal."

In the debate on Dr. Zuill's paper, Dr. Hoskins asked if the essayist advocated exercise in all cases of gastric indigestion. In reply Dr. Zuill stated that where exercise was at all possible that he thought it advisable. Dr. Ridge thought that bran and cracked corn mixed were most frequent causes of gastric indigestion, because this food was swallowed without masticating. Dr. Michener inquired of the essayist what his idea was in giving emetics to the horse. Dr. Zuill stated that emetics were not given to cause emesis but to contract the mucous membrane and force the food to the lower bowel. The essayist was accorded a vote of thanks for his valuable paper.

Dr. J. Curtis Michener then presented a paper on Meningitis, (see page 157.)

Debate on Dr. Michener's paper. Dr. Hoskins complimented Dr. Michener for his most elaborate and complete paper, upon a subject so interesting to the veterinarian and recommended that it be printed for circulation. Dr. Huidekoper stated that THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES would furnish the association with copies for its members. Dr. Harger thought 500 copies should be printed for circulation. Dr. Hoskins amended his motion by making it 1,000, which was agreed upon. Dr. Huidekoper asked the essayist if decomposed corn stalks caused any different kind of symptoms from those caused by other decomposing material. Dr. Michener said he did not recognize any difference, that this disease was liable to give any train of symptoms whatever. Dr. Rayner cited some cases where the animals had occupied a barn yard containing decomposing corn stalks. Dr. Huidekoper cited a case where the drenching of a building, after a fire, was followed by the disease, all the proprietor's horses (5) died, a sixth horse a boarder, fed from without, was not attacked. He inquired of Dr. Michener, whether he had found a low temperature favored the disease. Dr. Michener replied that it occurred at all seasons, most prevalent in August and September, and usually began to appear after harvest. Dr. Michener was accorded a vote of thanks by the association.

An application for membership was made by Dr. H. C. Miller, of Jenkintown, Pa., vouched for by Dr. Chas. Schaufler, of Philadelphia, was handed to the secretary.

Dr. Ridge, of Trevoise, Pa., cited a case of simulating Dourine, (see page 171).

The Treasurer submitted the following report for the year ending March 3, 1891.:

March 4, 1890.	Balance in treasury.....	\$ 11.76
Sept. 2, 1890.	Received as dues and membership fees.	132.00
		<hr/> \$143.76
	Report amount paid for printing, postage and legislative com., for year ending March 3, 1891.....	\$83.62
	Leaving balance in treasury of.....	60.14
	Report delinquent members fourteen.....	
	Indebtedness of delinquent members.....	\$97.00

J. R. HART, *Treasurer.*

On motion it was resolved by the association that the recording secretary should render statements each year of the indebtedness of its members.

The following committees were appointed by the president :

Committee on Legislation. Dr. Hoskins Chairman, Drs. R. S. Huidekoper, Francis Bridge, Robert Gladfelter, and Jas. Rayner.

Committee on Intelligence and education. Dr. Huidekoper Chairman, Drs. J. W. Sallade, H. A. Paget.

Committee on Sanitary Science and Police. Dr. Zuill Chairman, Drs. Francis Bridge, J. B. Rayner, J. H. Timberman, J. C. Michener, Geo. Magee and J. L. Bradley.

On vote of the association it was agreed to hold the September meeting at Wilkesbarre, Pa. Bills were presented by the corresponding secretary for printing, stamps, spencerian writing, (on certificates) etc., for \$17.50. The treasurer was instructed to draw an order for the full amount for the above bill.

The new officers were seated and the meeting adjourned at 5.15 P. M.

L. O. LUSSON, *Secretary.*

Nebraska Veterinary Medical Association.—The semi-annual meeting of the Nebraska Veterinary Medical Association was held March 10, 1891, in the parlors of the Merchant's Hotel, Omaha, Neb. The meeting was called to order by the President, Dr. E. Noble, and the following members reported to roll-call : Drs. Blackwell, Cosford, Ebbitt, Lord, Noble, Ramacciotti, and Young. Guest, Dr. S. Stewart, of Council Bluffs, Ia. Dr. Wilson, of Lincoln, was elected to membership. Dr. Lord presented a paper on Antiseptic Surgery, which was well received and thoroughly discussed. Dr. Young's paper was postponed by request. Dr. Stewart presented a paper on the use of Cannabis Indica in colic, which also elicited liberal discussion. The essayists were tendered a vote of thanks. On motion Dr. Stewart was elected an honorary member of the association.

The president appointed Drs. Young, Taylor and Dickey essayists for the next meeting, which will be held at Lincoln next September.

A motion prevailed to create a legislative committee, to secure if possible, the passage of an Act to regulate the practice of Veterinary Medicine and Surgery, now pending in the Legislature. The president appointed as such committee Drs. Ramacciotti, Lord and Cosford.

After the disposal of routine business the meeting adjourned.

S. E. COSFORD, *Secretary.*

Massachusetts Veterinary Association.—The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, January 28th. President Thomas Blackwood in the chair. The Secretary being absent the minutes of the last meeting were not read, and the roll was not called. Dr. J. M. Skally was elected Secretary pro tem. The following members were present : Drs. Blackwood, Osgood,

Marshall, Hadcock, Peterson, Emerson, Lee and Skally. After a general discussion of various topics the meeting adjourned.

J. M. SKALLY, *Secretary pro tem.*

The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, February 25, 1891. President Thomas Blackwood in the chair. Members present: Drs. Becket, Blackwood, Bunker, Emerson, Hadcock, Marshall, and the Secretary. Visitor, Dr. Wilbert Soule. Minutes of the two previous meetings, November and January read and accepted. The Secretary reported for Dr. Winchester, who was appointed a committee of one to invite Dr. Van Schaick, of the Pasteur Institute of New York, to address the Association upon rabies; that Dr. Van Schaick's time would not permit of his coming to Boston to give such an address at present. There was no essayist for this meeting, but Dr. Bunker agreed to read a paper before the Association at the March meeting, subject to be announced later. The members present then took part in a general discussion upon the following topics:

First, the action of the Cattle Commissioners regarding glanders and tuberculosis, and the folly of three laymen, such as the Board is composed of, in considering themselves as experts on animal diseases, and the harm they do the community in setting the opinion of competent veterinarians at naught. Second, the diagnosis of bovine tuberculosis, especially the difficulty of detecting the disease in its incipency.

Meeting then adjourned.

AUSTIN PETERS, *Secretary.*

Maryland State Veterinary Medical Society.—The fifth annual and forty-ninth regular meeting of the Maryland State Veterinary Medical Society was held February 19th, Madison Avenue and Orchard Street, Baltimore, with the President, Dr. W. H. Martenet in the chair. Roll was called to which the following members responded: Drs. W. H. Martenet, Geo. C. Faville, Wm. Dougherty, T. F. Barron, and H. A. Meisner. The minutes of the previous meeting were read and approved. Dr. Dougherty reported that the U. S. Veterinary Medical Association would hold their next annual meeting in Washington during September. Committee discharged with thanks. Report of Secretary and Treasurer was read and approved.

Under the head of new business Dr. Dougherty moved that a Committee of three be appointed to correspond with the Veterinarians of Washington relative to entertaining the U. S. Veterinary Medical Association. Motion carried and Drs. Dougherty, Faville, and Meisner were appointed. A paper on "The Duties and Responsibilities of a Veterinarian" by Dr. A. W. Clement, who was unable to be present was read with much credit by Dr. Geo. C. Faville. Dr. Dougherty was appointed essayist for the next meeting. Election of officers: Secretary was ordered to cast a ballot for

Dr. W. H. Martenet, for President, and Dr. Wm. Dougherty, Vice President, Dr. H. A. Meisner was elected Secretary and Treasurer. Board of Censors for the ensuing year are Drs. Wm. Dougherty, T. F. Barron, A. W. Clement, D. R. Hoffman and E. C. Schroeder.

After the election of officers the meeting was adjourned to meet at Montgomery's Hotel, where their annual banquet was held, during which a communication from Dr. Clement on Pseudo-Tuberculosis was read by Dr. Faville.

H. A. MEISNER, V. M. D., *Secretary*.

Society of Veterinary Graduates of Wisconsin.—The Society of Veterinary Graduates of Wisconsin was organized at Madison, March 18, 1891. The following officers were elected: President, V. L. Atkinson, V. S., Milwaukee; Vice-President, J. L. Scott, V. S., Beaver Dam; Secretary, W. P. Freeman, D. V. S., New Richmond; Treasurer, C. H. Ormond, D. V. S., Milwaukee.

Censors: J. F. Raub, D. V. S., Monroe; L. R. Baker, V. S., Madison; A. Kurtz, V. S., Appleton.

A Constitution and By-Laws were adopted, which limit the members to graduates of such colleges as are declared to be regular Veterinary Colleges by the Society. An important feature provides for blanks to be issued a month prior to every meeting with notice of business matters, on which the members may vote if they cannot be present.

Alumni Association, American Veterinary College.—A meeting of the Alumni Association of the American Veterinary College, was held in the lecture room of the college on March 18, 1891. Dr. Hoskins in the chair. The meeting was called to order at 11 A.M. Dr. LaBaw was appointed Secretary Pro Tem., in absence of Dr. Sellers.

On calling the roll sixteen were present. The minutes of the previous meeting were read and approved. The minutes of the Executive Committee of '90 were read and approved. Report of Executive Committee, Dr. Birdsall reported that the supper was to be held at the Brower House, cor. 28th St., and Broadway, and that the graduating class of '91 would unite with them. Dr. Birdsall further reported that the Alumni prizes consisted of five (5) standard medical books, to be given to the student passing the second highest examination.

Dr. LaBaw presented a bill from Sabiston & Murry, for books and supper tickets. Bill approved and secretary authorized to pay the same from assessment funds.

Dr. Coates reported on the present prospect of a new building. He said although there was still nothing definite or certain about the erection of a new building, yet a certain amount of progress had been made in the consummation of plans.

One plan for paying the debt on the lots \$30,000, still needed aid to the amount of \$7,000, to make it a success.

He had also found a man who was willing to erect the building and rent it to the college, giving the college the privilege of buying it in a certain number of years.

Dr. Coates was inclined to favor this latter plan and create a sinking fund, the money thus raised to be placed with a trust company and to be used for no other purpose than the purchase of a college building. A suggestion to sell the lots now held by the college was offered; but was objected to on the ground that they would not clear the incumbrance.

Resolutions were passed on the death of Dr. Lathrop.

Under new business a motion was made requesting the Executive Committee to endeavor to call the next meeting in the afternoon instead of morning. Seconded and carried.

Then came the election of officers.

The following members were elected to office for the ensuing year :

Dr. W. H. Hoskins, President, Philadelphia, Pa.; (re-elected), Dr. Lowe, Vice-President, Paterson, N. J., in place of Dr. H. Birdsall; Dr. Ackerman, Secretary, Brooklyn, N. Y., in place of Dr. A. T. Sellers; Dr. Strange, Treasurer, New York City, N. Y., (re-elected); Dr. Birdsall, Librarian, New York City, N. Y., in place of Dr. G. S. Lathrop, deceased.

Regrets expressed upon the death of Dr. W. J. Mitchell.

W. L. LABAW, *Secretary*, Pro Tem.

American Veterinary College, Commencement.—The 16th Annual commencement of the American Veterinary College, was held at Chickering Hall, New York, on Wednesday evening, March 8, 1891. The hall was packed to the last seat by the interested and enthusiastic friends of the graduates. The front of the stage was loaded with flowers, and Cappa's 7th Regiment Band added to the gaiety of the scene.

Prof. F. D. Weisse, M. D., President of the Board of Trustees, called attention to the increased number of Graduates, and the greater value placed by the public on Veterinary Medicine. Dr. Liautard made the annual report to the Board of Trustees, and presented the following gentlemen, who received their degrees of D. V. S.:

Edwin Braden Ackerman, Brooklyn, N. Y.; Edgar Daniel Bachman, Easton, Pa.; E. Lyman M. Bishop, Brooklyn, N. Y.; Oscar Emil Busener, New York City.; John Matthews Buckley, New York City.; Joseph William Burby, Holyoke, Mass.; George Brinton Burchsted, Providence, R. I.; Amos Oliver Cawley, Lewisburgh, Pa.; Horace Henry Choate, Windsor, Me.; Jonathan H. Conover, Cooper Hill, N. J.; Edward Connolly, New York City.; Israel Kline Deckard, Middletown, Pa.; James Edward Delaney, New York City.; David Brush Doughty, Woodbury, L. I.; Ralph Alexander Dunn, Titusville, Pa.; Clement V. Elliott, Vincennes, Ind.; Henry Deacon Fenimore, Rancocas, N. J.; Daniel Cameron Gearhart, Lewisburgh, Pa.; George Joseph Goubeaud, Brooklyn, N. Y.; Frank Harvey, Durham, N.C.;

Anton Phillip Hess, Wheeling, W. Va.; Fred. Sterling Hewitt, Meshoppen, Pa.; Russell Chancey Hurlbert, Ava, N. Y.; John Andrew Kenny, New York City.; Hermann Kock, Brooklyn, N. Y.; William Albert Kroos, Brooklyn, N. Y.; John Payne Lowe, Jr., Paterson, N. J.; James McDonough, Montclair, N. J.; John Joseph Meehan, New York City.; George William Meyer, New York City.; Wilbur John Murphy, New York City.; Edward James Nesbitt, Poughkeepsie, N. Y.; Edgar Odell, New York City.; Lewis Irving Palmer, West Bloomfield, N. Y.; Walter Hutson Phyfe, Delhi, N. Y.; William Erwin Smith, Sedalia, Mo.; Edgar Newton Stout, Greensburg, Ind.; Reginald Thomas, Decorah, Iowa.; La Forrest Everette Turner, Rockville Center, L. I.; Abraham Ditmars Van Siclen, Jamaica, L. I.

Prof. C. A. Doremus, M. D., announced the following prizes for the "Best general examination," a gold medal to Edward James Nesbitt, of Poughkeepsie, New York; for the "Second best general examination," a set of Standard Veterinary books, to Reginald Thomas, Decorah, Iowa; for the "Best practical examination," a gold medal, to Frank Harvey, Durham, N. C.; for "Best examination in Anatomy in the Junior Class," to Adam Wm. Ormiston; for the "Best paper read before the Medical Association, and defended, during the past year," a Case of Surgical Instruments, to Walter Hutson Phyfe, Delhi, New York. Dr. E. N. Stout gave the Valedictory for the graduating class, commencing with the conglomeration of technical terms as they appear to the student entering upon his career and coming down to practical logic at the termination, to represent their present ideas. Dr. D. B. St. Johns Rossa, M. D., gave an address eulogizing the advance and importance of Veterinary Medicine, as it is now recognized by the medical profession, together with good advice to the graduates as to their future duties and career.

The officers of the class were :

President, W. H. Phyfe; Vice-President, J. E. Delaney; Secretary, Geo. W. Meyer; Treasurer, J. McDonough; Class Historians, W. J. Murphy and J. P. Lowe; Marshall, C. V. Elliott; Committee, I. K. Deckard, G. J. Goubeaud, E. J. Nesbitt, J. H. Conover, E. Odell, O. E. Busener, A. O. Cawley, J. S. Lamkin, T. E. Budd, J. E. Delaney, Wm. E. Smith, W. J. Murphy, W. V. Bieser, G. B. Burchsted, J. J. Meehan, J. P. Lowe, E. B. Ackerman, H. H. Choate, J. M. Buckley, E. N. Stout.

After commencement the dinner of the Alumni Association was held at the Brower House. Toasts were responded to as follows :

American Veterinary College, Prof. S. D. Weisse; *The Faculty*, Prof. A. Liautard; *The Medical Profession*, P. Brush; *The Veterinary Profession*, Prof. Huidekoper; *The Alumni Association*, Dr. Hoskins; *Class Toast*, Dr. W. H. Phyfe. These were followed by an entertaining class history by Dr. W. J. Murphy, of New York. Dr. Murphy said that he would deal with idiosyncrasies of the class, and he mixed facts of removal by sickness, death and other cases, with good natured raillery of members of the class, which was probably understood better by them, than by the older members present. Dr. Murphy regretted the time spent at the College in the study of Chemistry, and said that the final problem was a mixture of 70 students, plus 10 examiners, less 17 missed vocation, which results in 40 graduates, and a residue of 13, the reaction of the latter is blue.

Chicago Veterinary College Commencement.—The Eighth Annual Class Day Exercises of the Chicago Veterinary College were held Tuesday, March 24, 1891, at Hooley's Theatre, Chicago. The degree of D. V. S., was conferred by Prof. R. J. Withers, upon the following gentlemen

Allen, J. M. Wisconsin; Annand, J. G. Minnesota; Arpke, H. A. Wisconsin; Archibald, R. A. California; Bagnall, W. P. Pennsylvania; Barnett, J. A. Illinois; Barnett, Otis Illinois; Berner, J. S. Minn.; Bone, J. L. Illinois; Borum, S. D. Illinois; Bristow, G. E. Illinois; Cain, G. E. Massachusetts; Cann, C. Kentucky; Chandler, T. W. Massachusetts; Ditewig, Geo. Illinois; Donaldson, R. H. Minneapolis; Drummond, R. H. Kansas; Depson, O. E. Illinois; Eels, T. C. Illinois; Eisenhower, A. L. Kansas; Fickert, A. F. Jr., Wisconsin; Finley, R. W. Illinois; Fisher, H. S. Illinois; Eitch, D. N. Indianapolis; Fitch, Schuyler, Indianapolis; Folts, D. R. Wisconsin; Fox, D. F. Illinois; French, A. H. Alabama; Gansel, B. E. Illinois; Givinn, E. E. Illinois; Hanna, A. R. Illinois; Harrington, W. B. Illinois; Hawley, H. W. Wisconsin; Heer, R. S. Illinois; Hinckley, E. R. Ohio; Hoover, Lee, Illinois; Johnson, H. J. Wisconsin; Judson, F. E. Illinois; Kelso, J. R. Wisconsin; Kerr, C. E. Illinois; Kinsey, G. W. Michigan; Kinyon, B. F. Wisconsin; Knight, W. A. Kansas; Laws, J. P. Illinois; Lames, R. Iowa; Leech, G. E. Wisconsin; Lennon, J. F. Illinois; Mabie, W. A. Indianapolis; Malone, J. H. Illinois; McNair, E. Illinois; Miller, Fred. Indianapolis; Mohlenhoff, R. H. Illinois; Mohney, C. E. Michigan; Montgomery, C. C. Illinois; Noble, G. E. Iowa; Quitman, E. L. Illinois; Richardson, W. J. Michigan; Rishel, E. H. Michigan; Robinson, W. P. Kansas; Rush, E. G. Ohio; Ryan, J. H. Illinois; Salusbury, H. H. Mississippi; Schaefer, V. Nebraska; Scott, C. E. Illinois; Seago, O. A. Illinois; Seaman, W. A. Illinois; Siegrosser, J. L. Illinois; Shipley, L. N. Iowa; Sherwood, A. E. Iowa; Smith, C. P. Illinois; Spencer, H. T. California; Stull, C. M. Indianapolis; Syler, J. L. Illinois; Watson, J. G. Illinois; Williams, C. Iowa; Wilmington, Jos. Illinois; Yeager, T. D. Illinois.

The Class Officers were :

President, W. A. Seaman; First Vice-President, Geo. Deitwig; Second Vice-President, R. S. Heer; Treasurer, R. A. Archibald; Secretary, Ora E. Dyson.

The Committee of Arrangements consisted of R. H. Donaldson, C. E. Kerr, H. F. Spencer, F. C. Eells, J. F. Lennon, C. E. Scott, A. R. Hanna, J. H. Ryan, J. L. Siegrosser.

REVIEWS.

DANCE'S VETERINARY TABLET. Wm. R. Jenkins, New York, 1891.

The tablet of A. A. Dance, copyright 1890, is a synopsis of the diseases of horses, cattle and dogs with the causes, symptoms and cures. It contains a tabulated sheet giving the part affected, diseases, causes, symptoms in horses, symptoms in cattle, symptoms in dogs, cures in horses, cures in cattle, and cures in dogs. Divided into external or local diseases of the skin, of the body generally, head, withers, udder, legs, hock, cannon, fetlock, and feet; internal diseases, system generally, organs of respiration, stomach, bowels and liver, kidneys and bladder, brain, eyes, throat and mouth. To these is added a series of some thirty prescriptions to govern these diseases.

This chart furnishes a general outline of the diseases of animals which will allow the owner, who has studied it, to select a specialist of practitioners who should be called in to aid him with the knowledge which he does not possess himself.

BOOKS AND PAMPLETS RECEIVED.

Sculptured Anthropoid Ape Heads, found near the Valley of the John Day River, Oregon; by *James Terry*. New York, 1891.

Further notes upon the Crania of North American Indians, by *R. A. Shufeldt, M. D., C. M. Z. S.* Reprinted from *Journal of Anatomy and Physiology*, Vol. xxx.

Memoria de Relaciones exteriores y carteras anexas presentada por el Secretario de Estado Don Ricardo Jimenez. San José de Costa Rica, 1890.

The Journal of the Cincinnati Society of Natural History. Vol. xiii., No. 4.

Bulletin of the American Museum of Natural History. Vol. iii., No. 1. New York.

Annual Report of the Board of Regents of the Smithsonian Institution for the year ending June 30, 1888. Washington 1890.

Transactions of the Canadian Institute. Vol. 1. No. 1. Toronto 1890.

Anales de la Sociedad Científica Argentina Tomo xxx. Ent vi. Buenos Aires 1890.

Bulletin de la Société Zoologique de France Tome xv. No. 10. Paris 1890.

Annalen des K.K. Naturhistorischen Hofmuseums. Band. v. No. 4. Wein 1890.

Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino. Vol. v. No. 74-93.

Bollettino Scientifico Anno xii. No. 4. Pavia 1890.

Der Zoologische Garten. Jahr xxxi. No. 12. Edited by *Dr. F. C. Noll*. Frankfort. AM. 1890.

Mittheilungen des ornithologischen Vereines in Wein. Jahr. xv. No. 2.

Il Naturalista Siciliano. Anno x. No. 2-3. Palermo 1890.

The American Naturalist. Edited by *E. D. Cope* and *J. S. Kingsley*. Published by Ferris Bros., Philadelphia.

Ottawa Naturalist. Vol. iv. No. 11.

Le Naturaliste Canadiene. Cap Rouge, Quebec.

Société Linneenne du Nord de la France. Vol. xix. Nos. 221-2 Amiens.

Special Report on Diseases of the Horse, prepared under the direction of *Dr. D. E. Salmon*, Chief of the Bureau of Animal Industry. Washington, 1890.

Report of the Commissioners of Fisheries of the State of New York. Albany, 1891.

Archives Neerlandaises des Sciences exactes et naturelles T. xxiv. Liv. Harlem, 1891.

Sitzungs-Berichte der Gesellschaft Naturforschender Freunde zu Berlin 1891.

Journal of the Asiatic Society of Bengal. Vol. lix., pt. 2. Nos. 2, 3, 5. Calcutta, 1890.

Johns Hopkins University Circulars Baltimore, 1891.

Bulletin de L'Academie Royale de Medicine de Belgique, T. v. No. 1. Bruxelles, 1891.

Ornis, edited by *Prof. Dr. R. Blasius* and *Prof. Dr. G. V. Hayke*, Jahr vi. Heft 4. Wein 1890.

THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES.

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No. 5.

UNIFORM VETERINARY EDUCATION.*

BY W. HORACE HOSKINS, D. V. S.

When I received the notice of this meeting from our worthy temporary secretary, conveying to me the information that I was to enlighten you this evening on the topic assigned for consideration at this time, I was as much astonished as I was forcibly impressed of my inability to afford you an evening's thought on so abstruse, so needful and so important a subject. With all these hurried thoughts rushing through my mind, it seemed to me an intangible mass, from which to work out some plan that was feasible in this wonderful country of ours. First came in my mind the legality of such a movement and whether such a National Board could be in existence with any power that would still work grander the veterinary structure we are rearing in America. Then from what source should this power come? The tendencies of recent years for a more centralized government in this country, has almost already awakened minds to rebellion, and every step in this direction is seized upon to-day by those of democratic ideas of government, to mark the faltering strength of our republican form of government, and the moving of authority away from the masses, pointed to as a lack of faith in the government under which we have grown to such a remarkable place in the world's history that, our career has dazzled the eyes of the potentates of

*Read before the Keystone Veterinary Medical Association, April 4, 1891.

every nation under the sun. By what power this body would be perpetuated and kept marking out a higher and broader sphere, and saved from deteriorating forces, that so often have followed in the history of similar organizations, or to be freed from the ensnaring and compromising influence of our spoils system, both by those who destroy by fawning, as well as by those more to be respected enemies, who fight openly and persistently the system under which we would hope only to work, that of merit and worth, all kept crowding one another to make more obscure the impenetrable maze that surround this subject. I had hoped the efforts put forth to have before you to-night, one of the foremost enthusiasts in the advancement of veterinary science in our country, had been successful and I would have had the pleasure of listening to the unfolding of his plans, for our future betterment and the strengthening of our position in the world of science.

This left one very ardent hope in my mind and I thought it commanded me in offering you my views on this subject to-night; it was the hope that among you, the Keystone members, some one would reach up to the full measurement of a plan, that would accomplish our hopes and wishes as veterinarians and we might as fellow-members indulge in the pleasure of sitting in his reflected glory and, one more laurel might be added to the honor of our association.

This subject of a single standard of education is not a new one in this country. As early as 1876 we find a number of the leading men, in the ranks of scientific workers for our profession, and filling valuable places in the channels of instruction for those who were to become a part of the veterinary profession, looking with a single eye to the good of our calling, sitting in deliberations over a single plan to achieve the acme of this work. At that time in North America the task seemed easier than now. A fewer number of schools existed and it only seemed necessary then for a single move on the part of three or four leaders, to consent to a lengthened course of study that would have answered the problem for future years. But it was a failure, and the intervening period from 1876 to almost 1886 it slumbered the sleep, that knows no waking and left for a future generation the solving of this knotty problem.

In 1884, as Chairman of the Committee on Intelligence and Education, in a report read at the September meeting in Cincinnati, Ohio, I suggested the wisdom of the schools of North America

teaching veterinary science, to meet in conference, for the purpose of considering a single standard of requirements. From this report grew the now fixed committee of that association which for seven years has labored to bring together representatives of these various schools, but all to no avail. I was honored for some three years with the chairmanship of that committee and my youth in the profession, coupled with a loving enthusiasm for my chosen avocation, required some three years of continued failure to chill my ardor in this much needed work. Others have followed with equal zeal only to learn as I had done the stumbling blocks to success. But I shall not forget here to place on record the aid and sympathy, full of honest acquiescence in any move that would accomplish the desired end, offered by several of the heads of leading veterinary institutions in North America. Nor shall I hesitate to say that those who proved the obstacles then are the ones who stand to-day in the way of the accomplishment of this work, and yea more; others are sowing the same seed, that they were scattering then, and justify themselves in their work, by the example of those who were earlier in the fields, seeking numbers, not few; wanting quantity, not quality; desiring sordid gain, rather than the hope of a place in posterity. Now the scenes have shifted and, it becomes our duty to endeavor to lift up the profession to a higher standard of requirements, than the sources from which many of us have emanated.

One year of work on that committee led me to see the hopelessness of a single standard of requirements, for preparation for the responsibilities of our work, and I then gave the remaining two years to the work of achieving at least a similar grade of entrance examinations and a minimum course of time for college work; but when confronted with the views of one of the leading institutions of veterinary science as expressed by its chief: "that he would rather have blacksmiths as students, than any others; as they made the best veterinary surgeons," you can form some idea of the hoplessness of my task and with what pleasure I laid down my duties for stronger hands, I hope, to carry to a more successful termination.

This brings me to the point of our subject for to-night, for I have lost faith, though reluctantly, in the forces that to-day control the veterinary schools of North America, and can see no floating beacons on the current of veterinary science as it surges through our entire country to-day, of a hope of any united effort on the part of the colleges themselves, for a unity of purpose in

work and achievements; for a grander, nobler, broader, stronger profession; fitted for the grave responsibilities of to-day and the graver ones before us in the future of to-morrow. But I do see a growing tendency in the development of mush-room schools in all sections and even in States, that forebode much evil and promise only to dwarf the progress of American veterinary science in every branch and channel of its work. I see its tendencies leavening the whole mass that make up our sources of instruction; the alluring baits held out for material to make the veterinarians of the future, make uncertain, unsafe the position of the schools in existence to-day and by lessening their sources of income, not profit, they check the disposition to broaden the curriculum, or lengthen the course of study, lest it deter students from entering and affording them a ready excuse. I have often heard expressed that they selected the easiest schools, because of the greater assurance of their being able to get through, and becoming a full-fledged doctor; little realizing the greater responsibilities before them in the field of labor. Why, gentlemen, the courses of some schools to-day are not long enough, nor broad enough to rise up to the full needs of preparation for the work, aside from the consideration of the time of a completed education. This leads us to the point of the duties of such a Board. I may be pardoned here in quoting the remarks of the Chief of our Bureau of Animal Industry, made in Chicago, in 1890, at the Convention of the U. S., V. M. A., "that should the bill then pending before Congress, outlining a plan for examining our food supply, principally our meat and milk, that he did not know where he could find men enough to do a tithe of the work," and I would add, from where in the ranks of the average American veterinary graduate could he find men competent to do the work? I shudder at the thought of the responsibilities that are soon to be heaped upon us as a profession, lest the work we were intended to do, should become a farce in the eyes of the scientific world and our profession the butt of ridicule or reproach. A National Board of Examiners to-day would only complete its work for our people, when it would send forth with its insignia, a man drilled as a veterinarian in the every-day work of our calling; trained as a surgeon in the application of mechanical skill for the relief he was destined to give; schooled in the knowledge of medicine and physics the domain of the volume of his work; fitted by experimental training in exercising the duties of a sanitarian; whether in the confines of a building for shelter, the field of hidden

sources of danger for our food supply and the place of preparation for consumption of those products which largely mould the strength and power of a Nation.

Is it not time for a veterinarian entering our ranks to-day to be so equipped, and where in our Nation to-day will he turn for such an education? In one centre he can secure a good preliminary education; in another he can learn well to treat the diseases of the equine species; in another he can secure a good training in surgery; in another he can secure a solid education in all the adjunct branches of our science; while in several others he can secure a smattering of all these, almost wholly from a series of lectures only. What would you think of a carpenter coming to your house to-day, to hang a door, who had never placed one in his career as an apprentice; what would you think of a plumber who would come to your home to place a drain, who had never laid a pipe in his days of being fitted for his work. Yet I can point to you to-day hosts of veterinarians who have emanated from their college parents armed with sheepskins, who never performed a single foot operation in their college career, whose eyes never covered the field of a microscopic slide, whose hands never compounded a ball of physic or placed a bandage on a limb, for even the purpose of warmth of sustaining peripheral circulation. Are these not sufficient reasons for a higher body to-day that shall give assurance to our people that we have qualified veterinarians, and afford to those who contemplate a place in our ranks for the good of the work he may do, a higher goal to aim for and a more valuable franchise than the average sheepskin that confers upon us the title of Doctor. Stepping aside for a moment, we may consider the value it may ultimately be in the creation of a single title and degree; thus casting aside the confusing degrees of D. V. M., B. V. M., V. M. D., D. V. S., B. V. S., V. S., and other conflicting titles that mar the uniform claim we all possess as veterinarians and lead among the laity, the disposition to place a relative value on the number of letters significant of our title, as well as to the complex way in which they are placed after our names; rather than to a consideration of the value of the sources from which we received our education.

Now shall this National Board be vested with authority by our government, by an act, finding its authority for creation at the hands of Congress? How far could such a body go, before trespassing upon State rights, so long as our schools are created solely by State jurisdiction? Would its creation lead to a

supervision of all schools by the general government and ultimately grants of powers and monies to make them complete. Could this be achieved under a republican form of government? Many will answer no! Many will answer yes, and point in support of the same the tendencies toward general laws for food inspection and adulteration; the agitation for government supervision and perhaps ownership of our telegraph system, and rising before us with such astonishing magnitude a new party, looking forward to the supervision of our railroads by the general government and asking you why not? when fully as many people in these rapid times use the railroads as use the post-office system, both of which are essential for our progress and welfare and equally useful. Personally I do not look with favor on its entire creation in this way, but would rather favor its chief being selected in this way only and government power being vested in it to the fullest extent permissible, with all deference to State rights; this power being rather in the direction of usefulness in fixing the standard of requirements and its perpetuation. This has one merit of making the source of its sustenance an easy problem, by placing it upon the National Treasury, but in these days I fear it would be an endless time in the distance before it could be achieved. Again, I have thought the Bureau of Agriculture might find it within the scope of its work to give this a resting place under its broad wings, under the claim of its field being so broad as to not only include in its domains, the health and longevity of our people; but the importance and value commercially of our live-stock interests. While this would answer for its creation I can hardly realize yet how it would bring to its feet the work it was destined to accomplish.

Then again, I have conceived of a government chief, with State Boards as adjuncts; these to be based upon the general plan as in effect to-day for the completion of a true Civil Service. The standards of requirements being fixed by a government head, and say two assistants, and then the work being put in application by the State Boards. This would involve the necessity of States accepting the provisions of the National law, passing laws for the creation of a State Board, these State Boards to be paid as State officers and to consist of three members; one to be appointed by the college or colleges jointly or in their not being any, by the State Association; one by the Governor and the third selected by these two. This plan would have the merit of least interference of State's rights and would only have as a grave objection the ex-

pense it would entail upon the State. Though this would in some measure be offset by, a fee being exacted before permission is granted for examination. These fees not to paid to the Board, but to the General Treasury; lest their number might be a temptation to the Board and bring forth the objections raised to-day to our Board of Pharmacy act; and the fees being exacted by County officers, that led to such indiscriminate registrations in the rural districts under the provisions of our State Veterinary Act.

Last of all, and that which has appealed most strongly to my feelings and belief in the sovereignty of the people, has been the creation of such a body, through the uplifting of our voices as veterinarians throughout the entire land, for its creation. Arising from the popular will of our own members, no school will long dare to defy its commands, nor turn itself away from it with scorn. Coming as it would from the outgrowth of a realization of its needs by the rank and file of the profession it would be destined to live a longer career when upheld and sustained by such a support. I would clothe such a Board with power to define who should become members of our United States Veterinary Organization. I should make it necessary by government statute for all applicants for positions in the army service, to be clothed first with its insignia; before being privileged to become competitors for a place, the same in our Bureau of Animal Industry, and thus remove it from the bane to-day of our infamous spoils system, and for positions on Sanitary and State Boards of Health, for Milk and Meat Inspectors and for positions as State Veterinarians. Its source of perpetuation might well emanate from the National Association of Veterinarians, thus giving it a fixed means of continuance. Our country might be then divided into a Central and an Eastern and Western division. To these might be delegated limited authority under such provisions as might prove useful to conduct the examinations for the central body. To have their graduates prepared so as to be able to pass this Board would in time be the goal and aim of all veterinary colleges and its passport the only one of worth in our country.

Make it the commanding necessity of every man selecting the veterinary profession as a calling, to use such discretion in his selection of a school, that would fit him for this higher examination; that some schools in existence to-day would have to take a broad step forward or drop out of the fight, and schools for private gain, self-vanity, and gratification, would be things of the past. Its authority emanating solely from the people, would prove the

strongest in the end and sustained by a united profession it would soon solve the question of a higher education for the future members of our calling, and its commanding position lift us up to higher altitudes than we have yet touched. Its number might be fixed at seven, with three for the profession outside of schools and four for specialists engaged in teaching, we could be assured of a fair hearing and just decision.

When you contemplate that four or more years are to-day exacted in learning the trades and many of the other avocations, when certain medical schools are considering the advisability of a four year's course, when the scope of knowledge to be had to-day in any branch of science has so broadened and deepened, when the old system once in vogue of apprenticeship in our profession has fallen into disuse, are you not convinced, that two short years' of five and a half, to seven month's, or a three years' course of five month's, are far too short for the education of a man to the ranks of a profession with the responsibilities of the magnitude that are ours to-day? Is it not time for every organization in our land banded together for the advancement of our cause, to rise up to the full dignity of its labors and demand the creation of some single higher body than to-day exists for the settlement of this question of a higher education? If colleges will not lift themselves up, if they have no greater devotion for the profession, than some are displaying; then it becomes no less our duty to adopt such means as will achieve this end.

DIVERTICULUM OF THE ŒSOPHAGUS.

BY A. W. CLEMENT, V. S.

CLINICAL HISTORY.—The animal has been in the possession of its present owner for about one year. He had been driven by the same coachman all of this time. During the first six months he was kept at livery. For the past six months the coachman has taken care of him. While the animal was at livery the groom said that he had a *strangling cough*. Two days after he came under the coachman's care he noticed, on entering the stable in the morning, that the animal was apparently in distress. On examination he found that the animal had left most of his supper in the manger. That when he attempted to swallow water it

returned by the nose and mouth. He then noticed a *lump* in the horse's throat. The attack lasted for about twenty-four hours, during which time the animal suffered great agony. He was very restless and breathed with difficulty. At the end of twenty-four hours the *lump* disappeared and the animal was apparently as well as ever. He had three subsequent attacks during the last of which he died.

AUTOPSY.—Subject, a thoroughbred chestnut gelding, five years old, of about 1000 lbs. weight, and in good condition. Autopsy nine hours after death. *General inspection.* Nothing abnormal to be noticed. No distension of the abdomen. *Special inspection.* Mucous membrane of nose presents striated and punctiform hemorrhages covering an area 5 cm. long and 3 cm. wide in widest portion. This condition in both nostrils. Mucous membrane of mouth pale. There are two superficial, greenish-looking ulcers on border of inferior maxilla, one on either side. Also two similar ulcers in corresponding positions on superior maxilla. "These ulcers were caused by the mouth speculum used shortly before death." Conjunctival mucous membranes somewhat yellow in appearance. There is no elevation to be seen over region of the œsophagus.

SUBCUTANEOUS.—Muscle dry, somewhat yellowish in color. Lymphatic glands reddened, especially in axilla.

ABDOMEN.—No fluid. Peritoneum normal, organs normal.

THORAX.—No fluid, no adhesions. Lung feels solid in lower portion of the posterior lobe, on right side. A mass about as large as a goose's egg can be seen in the medio-stinum, just at the base of the heart. Further dissection shows this mass to be in the course of the œsophagus. Heart and lungs with nearly all of the trachea and œsophagus removed *en masse*. *Pericardium* contains no fluid in cavity. Surface smooth and glistening. *Epicardium* smooth and glistening. There are a considerable number of sub-epicardial striated hemorrhages. Heart muscle firm and of normal color. Cavities filled with dark colored coagulated blood. The right heart contains rather more blood than does the left heart. *Endocardium* normal, valves normal. No sub-endocardial hemorrhages. Aorta normal. *Lungs and Pleura.* Right lung crepitant throughout. Pleural surface smooth and glistening. Left lung, at lower border of the posterior lobe in an area 15 cm. long by 7 cm. wide; in the widest portion is solid. The plural surface over entire lung is smooth and glistening. The solid area on section presents a grayish-red appearance. The

bronchi contains small particles of food; the mucous membrane is of normal appearance but there are many striated hemorrhages beneath the mucous membrane. The trachea contains some undigestible particles of food, is greenish in color on the mucous surface and there are some circumscribed ulcerations of the mucous. *Oesophagus.* There is dilatation of the tube to two or three times its normal size. The dilatation measures 60 cm. in length and from 10 to 13 cm. in width. It begins and ends quite abruptly. It starts from about opposite the third cervical vertebræ. 45 cm., from the beginning of the dilatation is a diverticulum projecting from the outer and slightly toward the lower border of the tube. This diverticulum measures 5 cm. in length, and 2.5 cm. in depth. It is empty, soft and very much thinner than the wall of the tube adjacent.

On section of the œsophagus there is seen to be a loss of muscle fibre with protrusion and dilatation of the mucous membrane to form the sack or diverticulum. The mucous membrane throughout the dilated portion of the tube is greenish in color. The muscle substance is flabby. The mass in the thoracic portion of the œsophagus is found to be a bolus of masticated food. THROAT and MOUTH organs normal. BRAIN and SPINAL CHORD, not examined.

LYMPHATICS.

BY B. F. KING, V. S.

The lymphatics are a system of vessels accompanying the venous system through the body, and are divided into two groups, the lymphatics and lacteals. The latter are exclusively confined to the small intestines; while the former are found in all parts of the body except the brain, eyeball, cartilage, tendons, horn and hair, and is termed the absorbent system. The history of the discovery of what is termed the absorbent system of vessels, dates from the vague allusion made by Hippocrate, Aristotle and others, to the description of the thoracic duct, in the middle of the sixteenth century, by Eustachius, and finally to the discovery of the lacteals by Asellius, in 1622, is more interesting in an anatomical, than in a physiological point of view. Our knowledge of anatomy of the absorbents dates from the discovery of the thoracic duct; and the discovery of the lacteals by Asellius dates the history of

these vessels as carriers of nutritive matter from the intestinal canal to the system. In 1649, Pecquet discovered the recepticle for chyle and demonstrated that lacteals did not pass the liver, but emptied the chyle into the thoracic duct by which it was finally conveyed to the venous system.

In 1651 the history of the absorbents was more fully completed by Rudbeck, who discovered a system of vessels carrying a colorless fluid through all parts of the body, and also demonstrated their identity with the lacteals. They were afterward studied carefully by Bartholinus who gave them the name of lymphatics. The old idea which dates from the discovery by Asellius and Pecquet that the lacteals absorb all the product of digestion, was overthrown by Magendie and others, who experimented upon vascular absorption.

One of the most difficult problems in anatomy is to determine the situation and origin of the lymphatics in different parts of the system. The tenuity of the walls of these vessels which render it impossible to study them by the ordinary methods of injection. Since it has been ascertained that the injection of a solution, generally Mercury, gently diffused into the vessel of origin follows the vessels as the fluid passes along their course into the larger trunks, and thence to the lymphatic glands, the regularity with which the minute vessels carry their burden through to the larger vessels to the glands, is positive proof that the lymphatics have been penetrated, and that the appearances observed are not the result of mere infiltration.

The mode of origin of the finest vessels in the lymphatic radicles is exceedingly obscure notwithstanding the numerous investigations which have been made within the last few years, particularly by the German anatomists. In fact, lymphatics have not been actually injected and demonstrated, in all the tissues of the body. But, because we have not been able to inject them, we are not justified in assuming positively that they do not exist. For example, in the intestinal villi, according to Sappey, they have never been seen, although we have no doubt of their existence. In the elaborate observations made by Dr. Belaiff, of St. Petersburg, speaking of the origin of the lymphatics of the penis and walls of the vessels, they were made apparent by the actions of nitrate silver in solution in pure water; and it is probable that they were very little distended for the smallest of these vessels had a diameter of about one three-hundredth of an inch.

Robins and his associates since found a curious system of ves-

sels which inhabit the brain and spinal cord, entirely surrounding the capillary blood vessels and connected with the lymphatic trunk or reservoir described by Fohman under the pia-mater. The capillary vessels thus float in a fluid contained in these cylindrical sheaths which exceed them in diameter about one twelve-hundredth of an inch. These investing vessels follow the blood vessels in their ramification and contain a clear fluid with bodies resembling the lymph corpuscle. When Robins first described these vessels minutely, he did not state definitely their physiological relation, but since, he has published a memoir in which he has described them as true lymphatic vessels, analagous to the lymphatic which partly surround the small vessels in fishes, reptiles, etc. In these animals the lymphatics in many parts nearly surround the blood vessels, to the walls which the edges of their proper coats are adherent, and that portion of the wall of the blood vessels which is thus enclosed, forms at the same time the walls of the lymphatics.

This disposition of the lymphatics of the brain and spinal cord, as found by Robins, would allow of free interchange by endomosis and exosmosis of the liquid portions of the blood and lymph. The lymphatic glands are arranged in groups in different parts of the body. They are oval in form and of a pinkish color and vary in size from a pea to a walnut. Each is covered by a capsule which, by numerous prolongations, forms a reticular framework in the interior of the gland. As the lymphatic vessels enter the gland their external coating becomes continuous with the capsule; they then divide into numerous minute branches which, after a twisting, winding way, unite into two or more vessels which, in leaving the gland, become again enveloped in their outer coat. In the interior of the glands the vessels are surrounded by granular cells and a plexus of capillary blood vessels.

The lacteals derive their name from the milky appearance of the fluid which they convey. They are the mesenteric absorbents, and between its layers they are supported. They take their origin from the small intestines, absorb the chyle which has been produced by digestion, and after passing through two or three absorbent glands, empty their contents into the receptaculum chyli. It is now known that the fatty portions of food reduced to a very fine emulsion by the pancreatic fluid are absorbed by this system of vessels, and that these are the only principles that are taken up in large quantities. The examples that I have already shown from these scientists are enough to establish the fact. If the

abdomen of a living animal be opened during full digestion, then and then only will the lacteals and thoracic duct be found distended with fatty emulsion. These vessels do not appear in the mesentery until the food has passed the orifice of the pancreatic duct. The observations of Sanders and Bouchardet remove all doubt as to the absorption of the products of the digestion, of fatty matter, by the lacteals, for these observers not only found that in dogs the proportion of fat in the chyle was increased, with an increase of fat taken in their food, but that the particular kind of fat given to the dog was recognized in the chyle. We have also seen that a certain portion escapes the lacteals and is absorbed directly by the blood vessels, and it is an important question to determine at the present day whether the lacteals, in addition to their more prominent functions, are not concerned in the absorption of drinks, the albuminoids, salines and saccharine matters.

The functional effects of this system are very important and extremely active in the constitution at large, for we are certain that the various organs of the body are continually changing wholly or partially their component parts, either for renovation or alteration, while it appears to be the office of the arteries to build up new parts and remove the waste of others—the old ones being removed by lymphatic absorption. By this wonderful power the roots of the temporaneous teeth are thus absorbed, that their crowns may more easily give way. It is in this manner that the vascular cartilages are taken up by the absorbents to make room for the bony deposits, when the animal approaches maturity. It is by the lymphatics that the dead parts are separated from the living in sloughing and ulceration, and by them that coagulated lymph and extravasated blood is removed.

The functional office of the lymphatics most important, is for the preservation of life under casualties. Long fasting is thus borne. Their capability of displacing the animal oil or marrow from the bones and the fat from the body is employed to make up the want. Hibernating animals live during their torpidity by a slow absorption of adipose matter. The absorbents seem to possess a power also of selecting the matter they take. The lacteals exclusively employ themselves in the absorption of chyle.

There is some difference of opinion among anatomists concerning the relative structure of the lymphatic glands. Some regard them as composed simply of a plexus of lymphatic vessels, held together by a delicate stroma of fibrous tissue, while others deny that there is any direct communication between the afferent

and the affluent vessel, assuming that the vessels which penetrate the glands break up into small branches which open into a parenchyma or gland with closed follicles, and that the fluids are collected from the gland by a second set of capillaries connected with the efferent lymphatics. It is probable that the lymphatics and lacteal vessels have no direct connection with the blood vessels except by the two openings by which they discharge their contents into the venous system, but the absorbent system shows that they not only collect fluids from the intestinal canal during digestion, but from nearly every tissue or organ in the body, and that these fluids are received into the venous circulation.

CANNABIS INDICA IN COLIC.*

BY S. STEWART, M. D., D. V. M.

This drug is found in the shops in the form of coarse powder, tincture, fluid extract and solid extract. It has long been used by human physicians for the relief of spasm and pain. It finds an occasional mention in veterinary literature. Finlay Dunn says little concerning it; classes it as narcotic, anodyne, and anti-spasmodic; and claims that it has no influence over normal respiration, circulation or temperature. He quotes Sir Robert Christianson as stating that "he has long been convinced that for energy, certainty and convenience, Indian hemp is the next anodyne, hypnotic and anti-spasmodic to opium and often equals it."

Doctor H. C. Wood once took a large dose of the infusion of hemp and knows from his experience that it obtunds the motor nerves as well as the sensory, and produces a peculiar disturbance of intellection, distorting both the sense of distance and duration.

Negative reports concerning the action of this drug have frequently been made because inert products have been supplied to the profession, but manufacturing pharmacists now produce more trustworthy preparations.

The fluid extract is the most reliable form of the drug and is a very convenient form to administer. Experience has taught me

* Read before the Nebraska Veterinary Medical Association.

that the mucous membrane of the mouth is an excellent absorbing organ and more trustworthy than the stomach, and I give this drug in one or two fluid dram doses, undiluted, by pouring it on the tongue from a small bottle or by injecting it into the mouth with a syringe. Oftentimes a single dose is sufficient, if not, it should be repeated in fifteen or twenty minutes, or more, and as often as the exigencies of the case require. I have given sufficient of the drug to produce hallucinations, yet no unpleasant after effects were noticed. It is a safe drug to leave in the hands of attendants for administration.

I have used this drug in about fifty cases and it has not failed to do what I expected it to do, namely, relieve spasms and abdominal pain. I have discarded opium and chloral hydrate in this class of cases, and do not expect to resort to them so long as this agent serves me so faithfully. In simple spasmodic colic no other medicine is needed. There are many cases of spasmodic colic which recover without treatment, and many cases which seem to yield to any plan of treatment which would probably have recovered spontaneously if not interfered with. Yet many cases do not recover even when drugs and manipulations are resorted to. When given charge of a case of spasmodic colic, the veterinarian cannot foretell the results, and seldom depends upon unaided nature to affect a cure. I give these cases *cannabis indica*; they recover.

In cases of acute indigestion, *cannabis indica* will relieve the pain, while other mendicaments correct the digestive disturbance. The same thing is true in obstruction or impaction of the colon.

A fine roadster, four years old, which was running in pasture daytimes and was stabled nights, during the Fall of 1890, contracted spasmodic colic one stormy night and was turned into an enclosed wagon-room while a surgeon could be summoned. Upon arrival at the farmer's barn some four miles from town, I found the colt rolling and tumbling violently; the hair and cuticle had been abraded from prominent portions of his face, giving the horse a dilapidated appearance; the paroxysms of pain recurred at short intervals; the temperature of rectum was normal, the attack had not been preceded by diarrhoea or scouring, the abdomen was not tympanitic. Two-dram doses of fluid extract *cannabis indica* were given every fifteen minutes for an hour, at which time decided relief was obtained; one-half hour later, the horse was dozing from narcosis produced by this drug. The attendant was instructed

to give two-dram doses of the drug every two hours during the remainder of the day. When the case was visited the next morning, the attendant reported that the pain had not returned but that the colt had stood very quietly and apparently had slept most of the time. Urine was passed easily and abundantly, no fæces were discharged, no food was taken. Found pulse 50, respiration 16, temperature 102. Instructed attendant to give the drug in the same dose every four hours until further notice. On the morning of the second day I found the temperature normal, respiration 12, pulse 44. Stalling had been profuse and a small quantity of fæcal matter had been discharged, the appetite was good. Convalescence was rapid without further medication.

A 1,200 pound work-horse used for hauling dirt was brought to my hospital at 5 P. M., he had eaten the noon ration as usual and showed no signs of illness until about 4 P. M. The horse gave evidence of spasmodic pain in the intestinal tract and was slightly tympanitic. Thinking this case depended upon intestinal indigestion, I gave one ounce of turpentine with one quart of linseed oil, followed by four or five two-dram doses of cannabis indica. The last drug subdued the pain and the oils cleared away the irritating ingesta. The next morning this horse called for food and required no further medication.

I have given this drug in the same manner to cows suffering colicky pains with just as gratifying results.

The details of many cases could be given if I thought they would interest you but I refrain from so doing, knowing that a trial of the drug will do more to convince you than all the cases I could describe. I would have you to understand that I do not recommend cannabis indica as a panacea for all cases of colic, or that it is to be depended upon to the exclusion of all other medicaments; but I do say that I have found it a certain agent for the relief of pain attendant upon bowel disturbances, that it does not produce delirium and constipation like opiates, that it does not blister the mouth like chloral, that it is always ready and easy of administration and a safe drug to leave for attendants to administer.

TUBERCULOSIS IN TIGRESS.

Cleopatra, a Bengal tigress 12 years old, weighing about 350 lbs. had been in confinement at the Menagerie, Central Park, New York, for 6 years and in perfect health until April 1st when she showed symptoms of illness, by refusing her food and general lassitude.

April 13th, she had become greatly emaciated, her skin was rough, the hairs had lost their lustre and stood on end; her nose was hot and dry; her face had a pinched, pained expression. She either lay in an awkward position in evident pain, or walked with her belly drawn up, and made attempts to stretch out, which she could not do. Her respirations, 30 to the minute, were labored, considerable movement of the thorax, being augmented by marked abdominal breathing. Auscultation near her mouth showed a tubular murmur, saliva flowed freely from her mouth and a mucopurulent discharge dropped from her nostrils. Her appetite was almost nil.

A diagnosis of double pneumonia was made, and pleuresy was excluded. As the lungs could not be auscultated, it remained uncertain if it was an idiopathic lobar pneumonia from cold, or a symptomatic lobular pneumonia due to tuberculosis or parasites. The cachectic condition of the animal rather pointed to tuberculosis and the prognosis was undoubtedly unfavorable.

As she would still take small pieces of meat, she was ordered small doses of iodide of potash to be given in them, with a pint of cod-liver oil and two drachms of tincture of iodine to be rubbed on the fore legs, which she licked off in her attempts to clean herself. Beef-tea in milk was also given.

On April 17th she appeared better, she had a less gaunt appearance, her hair had more lustre, she seemed more comfortable and her respirations were easier. She had eaten 14 lbs. of meat in the day and drank.

During the next few days she declined rapidly and died on April 22. Autopsy at College of Physicians and Surgeons same day by Dr. Geo. S. Huntington.

AUTOPSY.

Trunk of *Felis tigris* received April 22nd. Head and extremities removed at Museum of Natural History.

BODY well nourished. *Voluntary Muscles* well developed and healthy.

THORAX.—*Heart* normal; post mortem clots in vena cava. *Lungs*: Lobar pneumonia, involving both lungs in all lobes. Complete hepatization. Scattered miliary tubucles.

ABDOMEN.—*Alimentary Canal*: Normal — nearly empty. *Liver*: A few scattered miliary tubucles. Slight enlargement of mesenteric glands. *Spleen* normal: *Pancreas* normal: *Right Ovary* one cist—size of walnut: *Left Ovary* normal. Corpora lutea in both: *Bladder* normal: *Kidneys* healthy.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VET.

[Continued from page 180.]

IRREGULARITIES FROM FAULT OF LENGTH, OR EXCESS OF SIZE, OF ONE OF THE JAWS.

Deficiency in length of either of the jaws is rare in the horse, but sometimes occurs. The simplest form is where there is a slight projection of the lower jaw, (prognathism in man), in this there is excessive wearing of the lower incisors which complicates the determination of age. A more serious abnormality is deficiency in length in the lower jaw, (brachygnathism in man), which is followed by deformity of the intermaxillary bones; these curve down and interfere greatly with the prehension of food, especially at pasture.

In prognathism the lower table may project for a variable distance beyond the upper jaw, but it is rare that it extends beyond to any marked degree, and while it causes the teeth to wear away rapidly, there is not often any alteration in the incidence of the jaws. In brachygnathism, the difference in length of the two jaws may be very great, in some cases so great, that the upper jaw completely over-reaches the lower one, and by bending of the intermaxillary bones, the upper teeth drop over the anterior face of the lower teeth, while the latter point their tables directly into the hard palate; in other cases the posterior face of the upper incisors wear against the anterior face of the lower incisors until both become beveled into sharp wedges.

EXCESS OF WIDTH OF THE UPPER INCISIVE ARCH.

This condition is normal in old horses, without inconveniencing them, it sometimes occurs in young horses, in which the irregular wearing against the upper teeth produces marked notching, and sometimes interferes with the prehension of food; in one case, in which the excess of breadth of the upper incisive arch was due to the presence of supernumerary corner teeth, giving the arch eight teeth in all, the deformity was very marked.

IRREGULARITIES BY EXCESS OR FAULT OF USE.

As a general thing the incisive teeth have the same length in their free portion, although the whole tooth is constantly shortening each year, from the wearing away of its table, this even length is maintained by the roots being constantly forced from the alveolar cavities, and becoming a part of the free portion; transverse lines, filed at definite points on the anterior surface of the incisors, will be seen to approach the table and disappear one after another. Experiments by Pessina* showed that in common horses the annual wearing is about 4 1-2 millimeters while in thoroughbreds it is only about 3 millimeters; experiments by Bouley verified those of Pessina.

Girard, after numerous investigations, determined that the free portions of the incisors, from the gum to the table, averages 15 millimeters; this is subject to some variation, but normal pinchers rarely vary from 18 millimeters in length, intermediate teeth beyond 15 millimeters, while corner teeth are about 13 millimeters; variation in the length of the incisors may be from excess of length, or from deficiency of length.

EXCESS OF LENGTH.

This anomaly occurs in several ways, either occurring in both jaws, or in the teeth of the upper jaw alone, or at times only in certain teeth of one or the other jaw.

EXCESS OF LENGTH OF BOTH JAWS.

When the teeth of both jaws are too long, there is a general tendency for them to become parallel, that is to approach a horizontal direction, but their free extremities are diverged like the

* Pessina, Sul modo di conoscere dai denti l'età dei cavelli. Traduit de l'allemand par Luggi Ferreri et revu par Giuseppe Antonio Gross; Milano, 1831, p. 24 et pl. IX.

ribs of a fan and the wearing surface, or table, shows the character of the age of the horse; flattened in front to behind, they do not tend to take an oval form, the central enamel occupies a large portion of the dental table; there is often a little external cavity in the inferior corner teeth, the excess of length of the crown of the tooth is not in proportion to that of the root, the teeth are less solidly fixed in their alveolar cavities, and are subject to fracture from moderate violence, on account of the great leverage of the lengthened crown. These teeth on their table apparently show an age, which is sometimes very deceptive. To determine the exact age, it is necessary to shorten, by the imagination, the elongated teeth; determine by a close examination what would be the form of the tables of the teeth, were they cut off to their proper length; what would be the form and position of the cups and dental stars in such a shortened tooth; and give to the animal the age, which the alterations indicate.

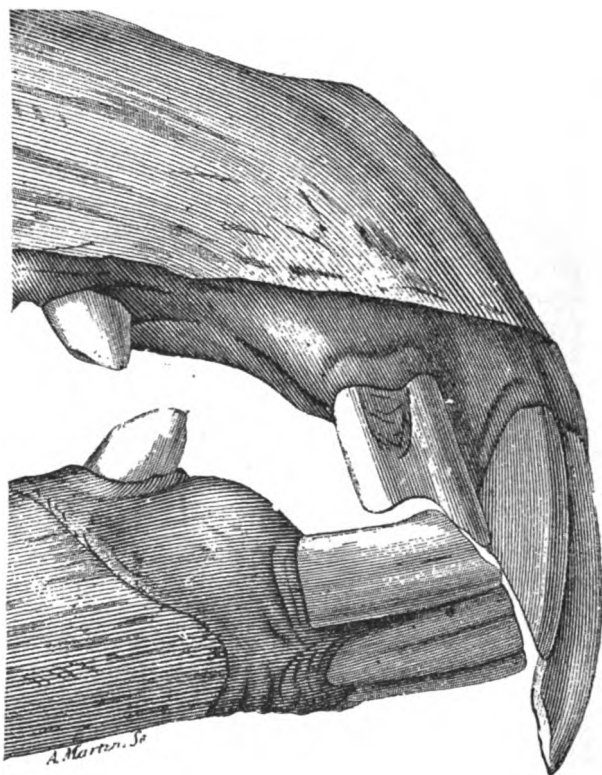


FIG. 69.

Cutting off incisors of great length in a young horse need not be considered a fraudulent act on the part of the dealer, for, while shortening of the long teeth of old age is a trick to deceive the ignorant, who associates long teeth with great age, the shortening of the teeth of a young horse gives a table indicating a greater age, and will not deceive the expert, who should always examine any horse on purchase.

EXCESS OF LENGTH OF THE INCISORS OF THE UPPER JAW.

This anomaly constitutes what is commonly known as *parrot-mouth*, (Fig. 69, 69a), on account of the analogy in the appearance of the upper jaw, to the corresponding beak of this bird. The upper teeth may acquire a length of 2 1-2 inches, and are frequently very much curved forward and downward, while their posterior faces are worn away to a sharp bevel by their contact with the inferior incisors; these latter are frequently shorter than normal, and the parrot's beak is formed by the pincher and intermediate teeth with only the internal border of the corner teeth,

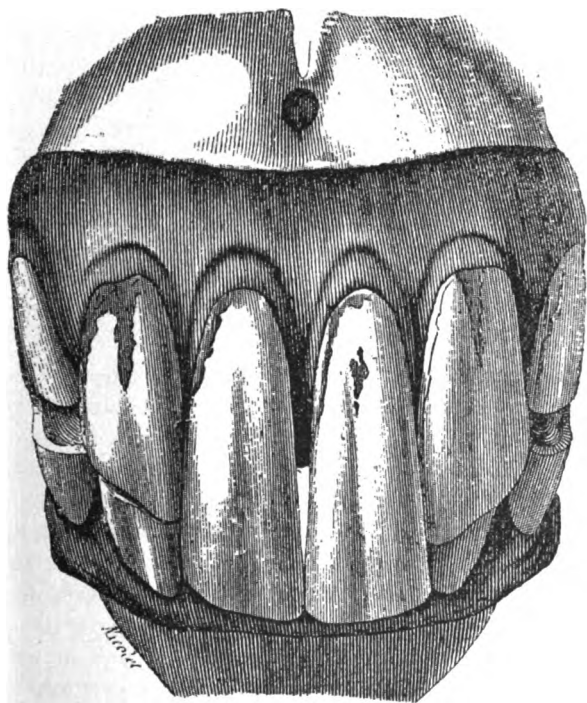


FIG. 69a.

while the rest of the latter is worn into a deep notch. These deformities are frequently much greater on one side of the jaw than on the other.

In some horses five years old, the upper jaw projects a line or two in front of the inferior jaw, whilst the posterior surface of the teeth in both jaws corresponds, which produces excessive wearing of the posterior part of the upper incisors, leaving a little line in front of their table, which predisposes to the formation of parrot-mouth. Usually, however, parrot-mouth is only seen in very old horses. It interferes more or less, according to its development, in the prehension of food, especially with oats, as the projection of the teeth interferes somewhat with the movements of the lips; the elongated teeth also render the maximum extent, to which the incisors can open, less than in a normal mouth; the latter can usually open 2 1-2 inches, or a little more, while in certain parrot-mouths the space between the open incisors, is only 1 1-4 to 1 1-2 inches. The bevelled and the distorted tables of the incisors in a parrot-mouth, render the determination of age, for these, practically impossible. The judgment of age may be based upon the relative characters, as to the inclination of the teeth, their color, their size, and what one supposes would be their tables, were they cut to their proper length. It frequently happens that a parrot-mouth so interferes with mastication on the part of the animal, that it becomes necessary to resort to operative measures, with the saw and file, to give the animal a normal mouth. This operation not only relieves the animal, but restores it to the appearance of its real age, and does not enter into the category of fraudulent measures.

EXCESSIVE LENGTH OF SINGLE TEETH OF THE JAW.

Mouths occasionally are seen in which only one, two, or a small number of the teeth are distorted, this occurs at times on one side only, or it occurs frequently that the teeth on one side, are very long, and those on the opposite side very short, corresponding with the inverse condition in the other jaw. In cases like this, as should always be the rule, as is necessary in all horses to determine age, to inspect them from both sides; in horses of seven or eight years old, a slight increase of wearing on one side of the jaw, will frequently make in the table mark, a deviation of a year or two in the appearance of the animal's age, which is readily corrected by a second examination from the other side.

DEFICIENCY OF LENGTH OF THE FREE PORTION OF THE
INCISORS.

Deficiency of length is seen only in very old horses, the teeth are always in apposition, except in the case of cribbing horses, when they may be so worn off so as not to reach those of the

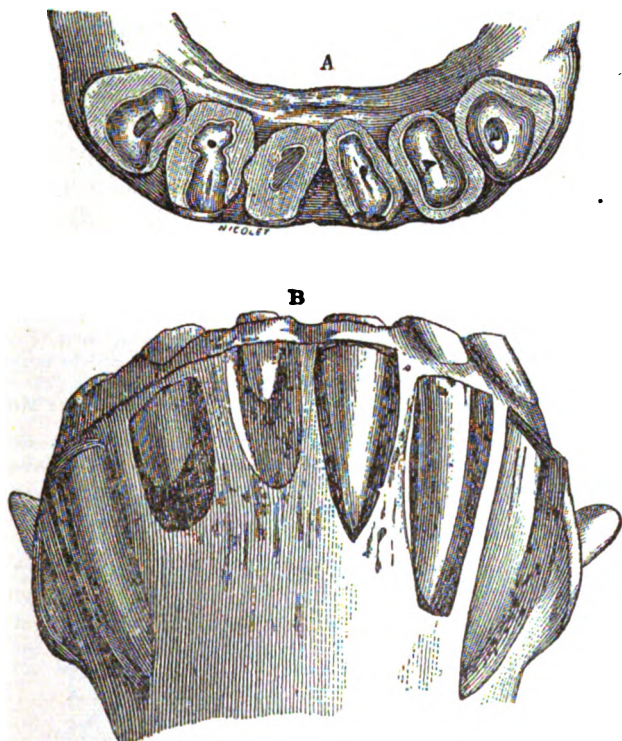


FIG. 70.

other jaw. The diminution in length may be so great, that nothing but a mere stub remains; this condition is frequently accompanied by *cementoma* or tumors thrown out by the irritated alveolar periosteum.

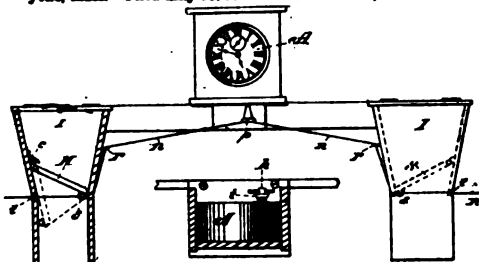
[TO BE CONTINUED.]

RECENT PATENTS

RELATING TO
VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month ending April, 1891.

448,256. AUTOMATIC ANIMAL-FEEDER. LUCIUS PIERSON, Holyoke, Mass. Filed May 31, 1890. Serial No. 363,780. (No model.)

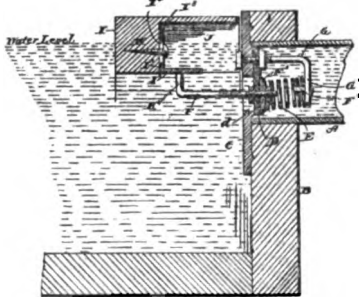


inclined therein to have their lower free edges attached to cords *n n*, passing thereto through the wall of the boxes, all operating as and for the purpose set forth.

Claim.—In an automatic feed-box for animals, the combination of a winding-key *h* and cord-winding pulley *i*, combined and adapted to be made fast to the alarm-winding shaft of a clock, a cord *m*, secured to pulley *i*, cords *n n*, attached to cord *m*, eyes *p* and *r* for guiding cords *n n*, and doors *H H*, hinged in boxes *I I* and

Claim.—1. The combination, with the tank and inlet-pipe, of the recessed float hinged within the tank and having plate *I I* within the recess, the valve in the inlet-pipe, the rod *F*, connected to the valve and having bent end *H I*, and the spring *E*, acting on said valve and arranged within the inlet-pipe, substantially as described.

448,262. APPARATUS FOR WATERING HOGS. GEORGE F. RUTHELS, Waco, Texr. Filed Jan. 7, 1891. Serial No. 377,017. (No model.)



2. The combination, with the tank and the inlet-pipe, of the recessed float hinged within the tank and extended at right angles to the inlet-pipe with the recess opposite the end of said pipe, the adjustable right-angled plate *I I*, secured in said recess, the valve in the inlet-pipe, the bracket *G* in the inlet-pipe, passed through one end of the valve and having vertical arm *G I*, the spring *E*, held between said arm and the valve, and the rod *F*, connected at one end to the valve and the other end bent upward at right angles to its length and arranged to engage the plate *I I*, substantially as shown and described.

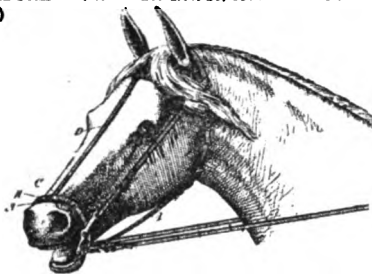
448,786. HOOF-SPREADING HORSESHOE. WILLIAM TORY, Guyborough, Canada. Filed May 29, 1890. Serial No. 363,663. (Model.)



sections *A A* and the two-armed spring *C*, the latter held by a pivot *G* in the space between the plates *E E* and sections *A A*, substantially as shown and described.

Claim.—The plates *E E*, integrally connected at the rear and provided in front with the calk *D* and clip *F*, in combination with the two pivoted

448,880. DEVICE FOR CONTROLLING HORSES. EDWIN J. FRASER, San Francisco, Cal. Filed Nov. 20, 1890. Serial No. 372,061. (No model.)



Claim. A device for controlling horses, consisting of an endless girdle surrounding the nose and chin of a horse, a spring or other elastic strip adjustably connected with the front of the girdle so as to rest upon the bridge of the horse's nose, pads fixed to the ends of said spring and retained by it out of contact with the nasal passages, suspending and adjusting straps by which the device is supported from the

headstall and throat-latch, and a bit independently connected with the headstall and with the driving reins, whereby a pull upon the reins will act to force the mouth open and through the opening of the mouth cause the spring to be bent and the pads to press upon the nasal passages, substantially as herein described.

Claim.—1. The combination, with a nailless horseshoe 1, of a quarter-boot 2, connected with the shoe and formed in two parts or sections 5 and 6, and screw-bolts 14, passed through the rear boot-sections 6 and adapted to bear against the hoof to tighten the boot, substantially as described.

448,812. DEVICE FOR ATTACHING HORSESHOES. RICHARD RANGLAY, Sodom, Ohio. Filed May 17, 1890. Serial No. 362,165. (No model.)



2. The combination, with a nailless horseshoe 1, of a quarter-boot 2, formed in two parts 5 and 6, hinged together on one side and provided with flanges 3 and lugs 9, the bolts 4, passed through said shoe and flanges, the bolt 8, engaging the lugs 9 to fasten the quarter boot, and the bolts 14, passed through the rear boot section 6 and adapted to bear against the hoof to tighten the boot, substantially as described.

3. The combination, with a nailless horseshoe 1, of the quarter-boot 2, formed in two parts hinged together on one side, the stocking 16, and the bolts 14, passed through the rear section of the quarter-boot to bear against the hoof and tighten the boot, substantially as described.

448,866. HORSESHOE-GAGE. WILLIAM C. PRIOR, Woodburn, Oreg. Filed Aug. 1, 1890. Serial No. 360,672. (No model.)



Claim.—1. In a gage of the class described, the combination, with a base having a series of radiating studs and adjusting-disks mounted on the studs, of a flexible gage-strip mounted within and embraced by the studs, substantially as specified.

2. In a gage of the class described, the combination, with a central base, of a series of radiating studs, friction-disks mounted on the studs and a flexible gage-strip curved and inserted between the disks

and having its upper edge extending above the base, substantially as specified.

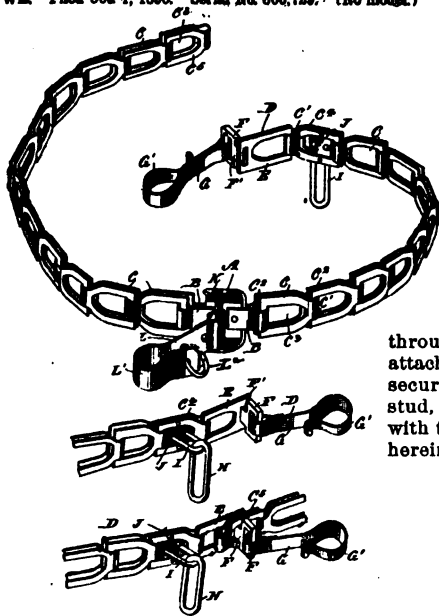
3. In a gage of the class described, the combination, with a central base, a series of radiating studs, and a series of adjusting-disks mounted on the studs, of a flexible gage-strip longitudinally slotted to loosely receive the studs and mounted between the sides of the base and the inner faces of the disks, substantially as specified.

4. In a gage of the class described, the combination with a central horseshoe-shaped disk, opposite heel, toe, and intermediate radiating studs and disks mounted for sliding upon and having frictional contact with the studs, of a flexible gage-strip provided with opposite longitudinal slots extending from each side of its centre to near the extremities, said slots receiving the heel and intermediate studs and provided with a central opening for the reception of the toe-stud, substantially as specified.

5. In a gage of the class described, the combination, with a central base having radiating studs, adjusting disks mounted on the studs, and a flexible gage-strip bent and sprung between the studs, of a gage sleeve or loop mounted upon one of the terminals of the strip, substantially as specified.

6. In a gage, the combination, with the base and an encircling flexible gage-strip, of combined strip supporting and adjusting devices extending from the base, substantially as specified.

8,548. ANIMAL-COLLAR. GUSTAV R. SACHSLEDORFF, Medford, Wis. Filed Oct. 1, 1890. Serial No. 366,739. (No model.)

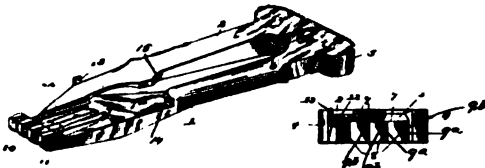


Claim.—1. In a chain adapted to serve as an animal-collar, the combination, with two chain-sections, of the U-shaped middle piece which connects them, a pin K, supported in the outwardly-curved end of said middle piece, and a cow-bell hook turning loosely on said pin, substantially as shown and described.

2. A chain adapted to serve as an animal-collar, the same being provided with a stud F, having a reduced neck or shank and secured to one of the terminal links and adapted to pass through the other terminal link, a hook attached to said stud, and the link H, secured to the chain contiguously to the stud, and thus adapted for engagement with the aforesaid hook to form the lock hereinbefore described.

Claim.—The herein-described improved animal-shears, comprising, in combination, the shank 1, having the flattened portion 7, formed with tines 8, having flat upper sides, cutting-edges 9, straight vertical sides 9a, downwardly and inwardly bevelled or inclined sides 9b, and shoulders 10, having blunt points 11, the shank 2, having the shearing blade 12, the connecting-spring 5, and the hook or stop 13, all constructed and arranged substantially as and for the purpose herein set forth.

448,557. SHEEP-SHEARS. JOHN W. STROTHER, Cherry Camp, W. Va. Filed Apr. 9, 1890. Serial No. 347,199. (No model.)



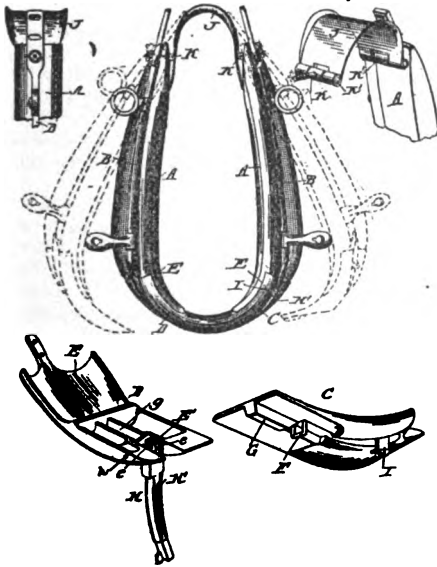
Claim.—1. In a training-blind, a main portion consisting of a straight longitudinal piece curved transversely, provided at its lower edge with a rearwardly-projected padded flange or supporting piece having its rear edge conformed to the contour of the front side of the animal's head just below the eyes and arranged and adapted at such rear edge to bear snugly against the animal's head, and provided with devices by which it may be secured in place, all substantially as and for the purposes set forth.

2. A training-blind, substantially as described, having a main piece or portion provided at its lower edge with a rearwardly-projected flange or portion and having along the edge of such flange or portion a cushion of fibrous-like material, whereby to fit closely against the face of the animal, and devices by which to secure the blind in place, substantially as set forth.

3. The improved training-blind herein described, consisting of the main portion A, made straight longitudinally and bent or curved laterally, the flange piece or portion B projected rearwardly from the lower edge of the piece A and having its rear edge conformed generally to the contour of the horse's face shortly below the eyes, the fibrous-like cushion secured along the said rear edge, the straps C, having loops Cⁱ, and the straps D, all substantially as and for the purposes set forth.



449,488. HORSE-COLLAR. **SEAS T. MARLETTA, Niagara Falls, N. Y.** Filed May 3, 1890. Serial No. 350,544. (No model.)



Claim.—1. An improved horse-collar provided at the ends of its sides with connection-pieces C and D, the connection D being provided with a socket *g* and a hook E, and the connection C being provided with a projection G to enter socket *g* and with a bearing F for engagement by the hook E, all substantially as and for the purposes set forth.

2. In a horse-collar, the combination of the connection-piece C, provided with a bearing F, the connection-piece D, and the fastening-bar pivoted to said piece D and provided with a hook E and side lugs *e*, substantially as set forth.

3. In a horse-collar, the combination of the connection-piece D, having a socket *g*, and connection-piece C, having a bearing F and a projection G to enter the socket *g*, the fastening-bar pivoted to the piece D and having a hook E, side lugs *e*, and handle Hⁱ, and the spring-catch I, all substantially as and for the purposes set forth.

4. In a horse-collar, the combination of the side pieces A, the hames, the cap-

piece, and the bolts hinged at their inner ends to the cap-piece, extended thence outward through the hames and secured, all substantially as and for the purposes set forth.

Claim.—1. The graduated U-shaped spring-expander having the upright legs at the heel and laterally-projecting feet thereof, and being pointed at the extremities of the feet, substantially as described.

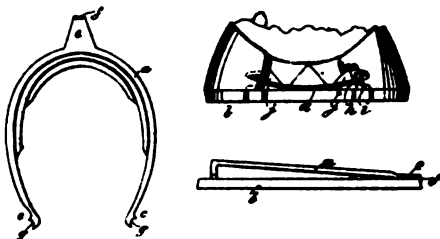
2. The combination, with a horseshoe, of a graduated U-spring hoof-expander interposed between the upper inner margin of the shoe and the hoof to which the shoe is attached, and having the hooked-tongue expansion of the middle to engage the toe of the shoe, substantially as described.

3. The combination, with a horseshoe, of a graduated U-spring hoof-expander interposed between the upper inner margin of the shoe and the hoof to which the shoe is attached, and having the notches of the heel extremities and the hooked tongue-extension of the middle, substantially as described.

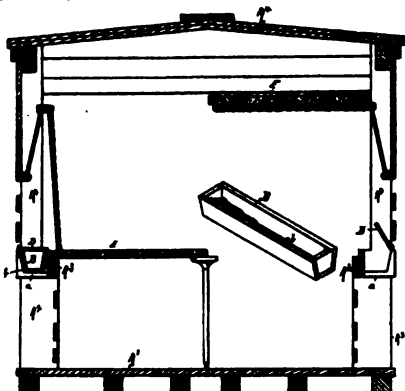
4. The graduated U-spring hoof-expander having the tongue-extension of the middle and the perforations for nailing said spring to the hoof, substantially as described.

5. The graduated U-spring expander having the tongue-extension of the middle and the feet and legs at the heel and the perforations for nailing the spring to the hoof, substantially as described.

49,578. HEEL-EXPANDER FOR HORSES GEORGE T. CHAPMAN, White Plains, assignor of one-half to William Harvey Morris, New York, N. Y. Filed Aug. 2, 1889. Serial No. 330,170. (No model.)



49,622. WATERING-TROUGH FOR STOCK-CARS JOHN C. HORN, Minneapolis, Minn., assignor, by mesne assignments, to the Elgin Stock Car Company, Chicago, Ill. Filed Mar. 12, 1890. Serial No. 344,204. (No model.)

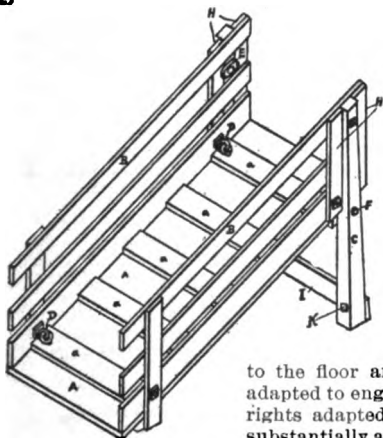


Claim.—1. In a stock-car, watering-troughs located within the spaces between adjacent side posts or stanchions and supported removably therebetween, in combination with removable double-deck sections located within the same horizontal plane with said troughs, the outer longitudinal edges of said deck-sections being wholly inside said side posts, whereby spaces are left between said side posts which are not covered by said deck-sections, and covers or lids pivotally connected to the frame-work of the car, which swing over said troughs and form shields thereto, said

covers or lids also bridging said spaces between the side posts along the longitudinal edges of said double-deck sections, substantially as set forth.

2. In a stock-car, watering troughs located within the spaces between adjacent side posts or stanchions and supported removably therebetween, in combination with covers or lids which swing over said troughs and which are pivotally connected to the frame-work of the car, substantially as set forth.

449,228. ANIMAL-CHUTE. LEWIS E. MYERS and SAMUEL H. ARNOLD, Canton, Ill. Filed Mar. 2, 1890. Serial No. 343,311. (No model.)



Claim.—1. The animal chute or gangway having its sides hinged to its floor, and means for locking the same in an upright position with relation to said floor, consisting of supporting-legs pivotally secured to the floor and a button on each of the legs adapted to engage a side, substantially as set forth.

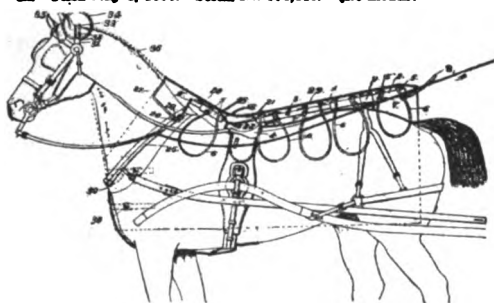
2. The animal chute or gangway having its sides hinged to its floor, and means for locking the same in an upright position with relation to said floor, consisting of supporting-legs pivotally secured

to the floor and a button on each of the legs adapted to engage a side, said side having up-rights adapted to receive a leg between them, substantially as set forth.

3. The animal chute having inwardly-folding hinged sides and having legs provided with pivots which have their axes transverse to the side pieces of the floor and in the same plane therewith, substantially as set forth, whereby the sides can be folded down upon the floor and the legs placed parallel with the same.

Claim.—1. In a protector of the class described, the combination, with a back-brace formed in sections, each of which is hollow, and one of said sections being adapted to slide within the other, of a series of pairs of clips secured to the upper sides of the brace and a series of arms of spring-wire bent to form loops and sprung between each pair of clips, substantially as specified.

449,582. HORSE-PROTECTOR. SAMUEL P. HOBBS, Pittsfield, Ill. Filed July 2, 1890. Serial No. 353,112. (No model.)



2. In a protector of the class described, the back-band of a harness, a central brace provided with protector-supporting arms, a protector mounted on the arms, and a clasp removably secured to the brace and to the said backband, substantially as specified.

3. In a protector of the class described, the combination, with a back-section and the shoulder-braces, each of said braces being formed of two sections telescopically connected, the front section of the shoulder-brace being provided with perforations and the rear section with a bolt for taking into anyone of said perforations, of a series of transverse arms, a protector or cover mounted on the arms, and a loose link connecting the ends of the braces, substantially as specified.

4. In a protector of the class described, the combination, with a pair of hame-sections having screw-eyes, of a central back-section adapted to be secured to the harness and provided with protector-supporting arms, a curved rectangular frame, the side bars of which are provided with offsets for engaging the eyes, and a cover supported by the arms and said rectangular frame, substantially as specified.

5. In a protector of the class described, the combination, with the main central

brace, the secondary brace, the link connecting the two, and the arms projecting from said braces, of the crown-strap of the bridle, provided with opposite pairs of clips, a spring-wire frame mounted in the clips and having opposite upturned end portions forming a bonnet-frame, a bonnet mounted on said frame, and a cover or protector mounted on the arms, substantially as specified.

6. The protector-brace provided with lateral supporting-arms, the cover mounted on the same, and the herein-described fastening device, the same consisting of the base-plate provided with the depending T-lug for connecting with the back-strap, the upwardly-diverting leaves, one of which terminates in curved prongs, and a leaf hinged to the opposite prong and oppositely notched and adapted to be sprung over and between said prongs, substantially as specified.

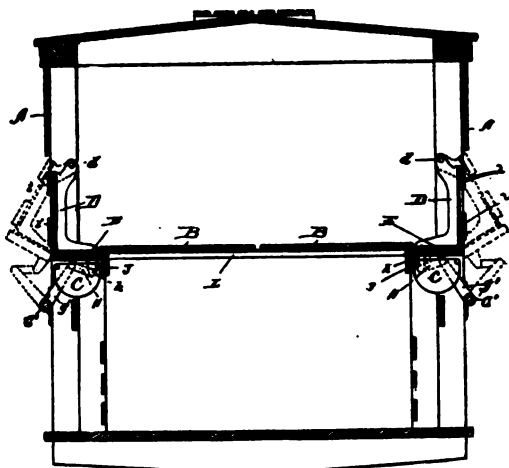
7. The back-strap of a harness, provided near its front and rear ends with clasps 9, the herein-described protector-frame, the same comprising a central longitudinal main section and a series of laterally-disposed arms 6, and the protector mounted over the arms, substantially as specified.

Claim.—1. In a stock-car, the side posts thereof, watering troughs located between said side posts, and a removable upper deck located when in position for use in substantially the same horizontal plane as said troughs, in combination with brackets pivoted between each pair of side posts, the pivotal points of said brackets being located above said troughs and said brackets being so pivoted that their lower ends swing outwardly, each pair of brackets carrying on their lower end a plank or lid which when said brackets occupy their normal position serves both as a cover for the trough therebeneath and as an extension between the side posts of the upper deck, said brackets being capable of swinging outwardly far enough to uncover said troughs, substantially as set forth.

2. In a stock-car, the side posts thereof, watering-troughs located between said side posts, and a removable upper deck located when in position for use in substantially the same horizontal plane as said troughs, in combination with a pair of brackets pivoted between each pair of side posts, the pivotal points of said brackets being located above said troughs and said brackets being so pivoted that their lower ends swing outwardly, each pair of brackets carrying at their lower ends a plank or lid which when said brackets occupy their normal position serves both as a cover for the trough therebeneath and as an extension between the sideposts of the upper deck, said brackets being capable of swinging outwardly far enough to uncover said troughs, and said brackets carrying slats *i i*, which constitute when the brackets are in their normal position part of the exterior boarding of the car, substantially as set forth.

3. In a stock-car, the side posts thereof, watering-troughs located between said side posts, and a removable upper deck located when in position for use in substantially the same horizontal plane as the said watering-troughs, in combination with

449,621. DOUBLE-DECK STOCK-CAR. JOHN C. HICKS, Minneapolis, Minn., assignor, by mesne assignments, to the Hicks Stock Car Company, Chicago, Ill. Filed Feb. 17, 1890. Serial No. 340,766. (No model.)

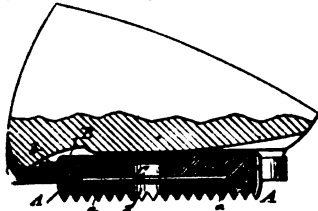


a pair of brackets pivoted between each pair of side posts, the pivotal points of said brackets being located above said troughs, and said brackets being so pivoted that their lower ends swing outwardly, each pair of brackets carrying at their lower ends a plank or lid which when said brackets occupy their normal position serves both as a cover for the trough therebeneath and as an extension between said side posts of the upper deck, said brackets being capable of swinging outwardly far enough to uncover said troughs, and longitudinal slats *i i*, extending along the sides of the car, said slats being secured to the outer edges of a plurality of said pairs of brackets, whereby said slats perform a threefold function, to wit: first, they constitute when the brackets are in their normal position a portion of the side walls of the car; second, they enable a plurality of the pairs of brackets to be operated simultaneously, and, third, they constitute stops to prevent the inward swinging of the brackets, substantially as set forth.

4. In a stock-car, the side posts thereof and watering-troughs located between said side posts, in combination with outwardly-swinging covers or lids, one for each of said troughs, each cover or lid being pivotally connected with and between two of the side posts, a longitudinal shaft journaled along the side of the car and common to a plurality of said lids or covers, a plurality of crank-arms on said shaft, and links connecting said crank-arms and said lids or covers, substantially as set forth.

5. In a stock-car, the side posts on opposite sides thereof, watering-troughs located between said side posts on both sides of the car and a removable upper deck located when in position for use in substantially the same horizontal plane as said troughs, in combination with a pair of brackets pivoted between each pair of side posts, the pivotal points of said brackets located above said troughs and said brackets being so pivoted that their lower ends swing outwardly, each pair of brackets carrying at their lower ends a plank or lid which when said brackets occupy their normal position serves both as a cover for the trough therebeneath and as an extension between said side posts of the upper deck, said brackets being capable of swinging outwardly far enough to uncover said troughs, longitudinal slats *i i*, extending along each side of the car, said slats on each side of the car being secured to the outer edges of a plurality of said pairs of brackets, whereby said slats perform a threefold function, to wit: first they constitute when the brackets are in their normal position a portion of the side walls of the car; second, they enable a plurality of the pairs of brackets to be operated simultaneously, and, third, they constitute stops to prevent the inward swinging of the brackets, a longitudinal shaft *G1*, on each side of the car, a plurality of crank-arms *g1* on each shaft, a plurality of links *H*, connecting said crank-arms and said brackets, an operating-wheel *f* on the end of the car, crank-arms *g* on the end of each shaft, and links *G*, connecting said crank-arms *g* with said wheel *f*, substantially as set forth.

449,868. HOOF-PAD. JOHN KRAM, New York, N. Y. Filed Jan. 7, 1891. Serial No. 376,961. (No model.)



having transverse ribs at its under side, an arc-shaped plate embedded into the front part of the pad and provided with projecting lugs at the front and sides, a cavity at the middle portion of the pad, and a longitudinal pin embedded in the pad and extending centrally through said cavity, substantially as set forth.

Claim.—1. A hoof-pad for horses, composed of an elastic pad having transverse ribs at its under side, projecting lugs out of its front end and sides, a cavity at its middle portion, and a longitudinal pin secured to the pad and extended centrally through the cavity, substantially as set forth.

2. A hoof-pad for horses, consisting of a pad of elastic material

EDITORIAL DEPARTMENT.

NEBRASKA.

The Western States can teach their older sisters in the East, a great deal in the way of energy and of economy, by their interest in the advancement of agriculture and stock interests, and their closely allied supporter, veterinary medicine. They recognize, as should every State in union, the value of veterinary services. They appropriate annually for veterinary investigation and research, what New York or Pennsylvania, with a much heavier investment in live stock, refuses, even as a foundation for veterinary institutions, whose work is carried on practically as a labour of love. Every stone, however, to the establishment of veterinary medicine, means a stronger basis, and the prospect of growth, and we hail with pleasure, everything which aids the profession. We trust that the action, of the Board of Regents of the University of Nebraska, as given below will furnish an example to be followed, as it should be, by all of the States.

EXTRACT FROM REGENTS RECORD, UNIVERSITY OF NEBRASKA.

April 8, 1891.

Whereas, the live stock interests of this state, represented by a special committee, and otherwise, request and urge renewal of investigations of diseases of domestic animals ; and that Dr. F. S. Billings or some person of equal earnestness and ability be appointed to conduct and carry on such investigations, and

Whereas, this Board is convinced of the importance of said measures, and the magnitude of property interests involved, now, therefore,

Be it resolved, that this Board take steps to renew at the earliest practicable moment, such investigations ; that Dr. F. S. Billings be employed for a period of one year from July 1, 1891, to conduct said investigations under the authority and direction of this Board ; that for the purpose of covering the cost of said proposed investigations there is hereby appropriated from the Hatch Experiment Station fund, so-called, for the year commencing July 1, 1891, the sum of \$10,050, to be applied as follows :

Salary of Dr. Billings, - - - -	\$3,600.00
Salary of an assistant, - - - -	1,200.00
Salary of a Chemist, - - - -	2,000.00
Fitting up building, - - - -	750.00
Laboratory equipment, - - - -	500.00
Incidental expenses, - - - -	2,000.00
	<hr/>
	\$10,050.00

That payment of salaries be made quarterly, or monthly if practicable, and that other expenditures contemplated be covered by duly approved vouchers as are other obligations of the experiment station, and the University :

Resolved, that the Fine Stock Breeders' Association be and are hereby requested to appoint a Conference Committee of not less than three prominent and experienced live-stock men, who shall observe, suggest and recommend concerning experiments and investigations and the character of the work of the investigator selected, and meet from time to time with the Board and confer thereon, and also use their influence through the State to advance and promote the service hereby contemplated."

Adopted.

J. S. DALES,

*Secretary of the Board of Regents,
University of Nebraska.*

CONTAGIOUS PLEURO-PNEUMONIA.

COST OF SUPPRESSION IN ILLINOIS.

The following letter from the Secretary of the State Board of Live Stock Commissioners of Illinois, is of interest as a record of the number of animals which were quarantined and slaughtered in the outbreak, of the lung-plague in Illinois, together with the cost of inspection and indemnity. It will be of interest to hear more upon the subject and to learn what return in value of usable parts of the beeves was made, and what disposition of the carcasses was required.

STATE OF ILLINOIS, STATE BOARD OF LIVE STOCK COMMISSIONERS.

SPRINGFIELD, April 14, 1891.

JOHN W. GADSDEN, M. R. C. V. S.

128 N. 10th St., PHILADELPHIA, PA.

MY DEAR SIR :—

Your letter of the 10th inquiring as to the cost of stamping out the outbreak of Contagious Pleuro-pneumonia in Cook County, 1886-88, is received, and I have endeavored to compile the figures as accurately as possible, within the brief time, without going into the expense of vouchers for the detail expenditures in order that the expense items might be exact. There were slaughtered, diseased and exposed cattle, by order of this Board, or by the owners on permits issued by the Board, and inspected by our veterinarians, 10,732 cattle; 107 died from the disease between the period of quarantine and the date of the commencement of slaughter, making the grand total, 10,839. The State of Illinois paid \$35,730.75 for 3,032 head of these cattle, an average of \$11.78 per head, while the United States Government paid \$19,737.31 for 1,177 head, or an average of \$17.66 per head. So that, of the 10,839 head, 4,209 head were paid for; 107 head died from the disease, 6,523 head were slaughtered by owners on permit, the State paying for 1,855 head more than were paid for by the Government, and the average amount paid by the State per head was \$5.88 less than the amount per head paid by the Government. The expenses of the suppression of this outbreak other than for damages for animals slaughtered, paid by the State, in round numbers, was about \$20,071, while the amount of expenses other than for damages for slaughtered animals paid by the Government was \$60,106.21, as appears from the reports of the Bureau for 1887-88. The total amount for all purposes, in the suppression of the outbreak, paid by the State, was about \$55,801.75, and by the Government \$79,843.52, or a grand total of \$135,645.27.

This outbreak was discovered September, 12, 1886, and the last case of disease found was December 29, 1887, a period of one year, three months and seventeen days, and quarantine restrictions were removed three months and two days later, or on April 1, 1888.

While the Chief of the Bureau of Animal Industry, in endeavoring to explain the reasons, in the report of 1887, for the very great difference in the amounts paid by the Government for slaughtered animals, and for other expenses of suppressing the

outbreak, gives some legitimate reasons for this, one of the principal reasons, in our opinion, is omitted, and is to be found fully set forth in the report of this Board for 1887, wherein a sample of the work done by the employes of the Bureau of Animal Industry is described; it having required twenty deputy sheriffs, and three veterinarians, in the employ of the Bureau, forty-eight days to quarantine 1,217 head of cattle in 357 stables at a cost of \$3,300, or \$2.75 per head, while, shortly thereafter, the employes of this Board, in the same locality, with but fourteen men, in thirty-five days, quarantined and registered 10,192 cattle in over 7,000 stables at a cost of but ten cents per head. Very much, also, of this expense, endeavored to be satisfactorily explained by the Chief of the Bureau, is due to the policy inaugurated and carried out by him during the last six or seven months of the "War," contrary to the advice and wishes of this Board, and his chief inspector at Chicago, Prof. James Law, of stopping the enforced slaughter of exposed animals, and permitting the disease, in the language of the Chief Inspector, "to burn itself out," while a large corps of veterinary inspectors were kept inspecting and re-inspecting the exposed animals in quarantine, all of which eventually had to be killed, after a useless delay of many months.

Trusting the above information is what you desire, and that it will prove advantageous to your purpose, I remain,

Very respectfully yours,

B. JOHNSON, *Secretary*

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEO. BREISACHER, V. M. D.

ANTISEPTIC PROPERTIES OF COFFEE INFUSION.

The investigations of Dr. Lüderitz the results of which were published in the *Zeitschrift f. Hygiene*, Bd. 7, Nr. 241, show that an infusion of coffee possesses decided antiseptic properties. Bacteria of every kind are destroyed by its influence. It has not been ascertained as yet through which chemical substance this action is exerted. Caffein seems to have very little influence, tannic has a somewhat stronger influence; the chief action however

seems to depend upon the empyreumatic substances that develop through the roasting of the coffee. *Wochenschrift f. Thierheil. No. 47.*

THE ACTION OF VARIOUS DRUGS IN VETERINARY PRACTICE.

Jahresberichten Bayrischer Thierarzte. 1889.

Antefebrein.—In distemper and the various febrile diseases, good results were gotten in the dog with 30 to 45 grains.

In horses or cattle doses of 20, grammes lower temperature from $1\frac{1}{2}$ to 2 degrees.

Apomorphin.—In bronchitis is contra-indicated when at the beginning of the attack there exists an increased respiration.

In some cases doses of 0.1 grammes per day have caused excessive dyspnoea through its decided action upon the mucous secretion. This drug should be used with great care. Used subcutaneously in dogs it acts as a prompt emetic.

Creolin.—In traumatic lesions of the uterus, in acute and chronic metritis, in skin diseases of every kind and in diphtheritis of the chicken is highly recommended.

Eseridin.—In doses of 0.2 grammes pilocorpin-eserin has very little action. Doses of 0.1 grammes of eseridin, subcutaneously, exerts a decided action in 10 minutes, in horses. Its administration should be followed by a dose of aloes.

Ichthyol (Ammonium sulfo-ichthyolicum).—Has a very good action in articular rheumatism, applied externally. It has been used dissolved in glycerine 1 to 10 and in vaseline 1 to 5 parts.

Sodium Chloride.—Exerts a very good influence in cases of shoulder and hip lameness when injected subcutaneously—one part of concentrated nace to 2 or 3 of water.

Liquor alumnii acetici.—Is very highly recommended for the treatment of wounds and especially in the various affections of the uterus. It does not cause peristalsis of the uterus as does carbolic acid creolin and corrosive sublimate, and has no poisonous action.

Thierheilkunde 51, '90 to 3, '91.

PYOKTANIN IN FOOT AND MOUTH DISEASE.

This substance which was discovered by Prof. Stilling—Strassburg, has given very good results in foot and mouth disease. Dr. Mehrdorf who from July 15 to November 15 1890 had occasion to use this substance in 1293 cases (swine cattle and goats) asserts

that in his 20 years of practice he has not met with such an active agent for the combating of foot and mouth disease as pyoktanin.

The advantages of pyoktanin are:— 1st that the timely application will in the future prevent all losses; 2nd that through its use the condition of the animal is very little or not at all affected; 3rd that the cessation of the milk secretion lasts but a few days; 4th that the disease assumes a mild character; and 5th that draught animals are in short time after the attack capable of executing work again. The only objection to the remedy is that it stains the hands very intensely (according to the editor of *Thierheilkunde* soap dissolved in alcohol removes the color entirely) this property has however on the other hand the advantage that it shows exactly to what extent the remedy has been applied to the diseased parts. Dr. M. used as solution of 1 : 1000. See original article for details. *Wochenschrift f. Thierheilkunde* No 4, 1891.

DIPHTHERITIS IN POULTRY.

In Oct. a farmer sent to Veterinarian Thum two turkeys with the history that they were affected with loss of appetite or inability to eat. It was furthermore stated that the entire stock was likewise affected. The head and neck of the turkey examined showed numerous nodules or papules which lead immediately to the idea that he had to do with diphtheritis, and this surmise proved to be a correct one, for upon opening the bill of the fowl he discovered numerous diphtheritic patches. The animals were treated with external applications, one day with acid carbolic, 1 part to glycerine 100 parts, the following day with creolin 2 parts and glycerine and aq. distill., aa 50 parts. This treatment was continued for three weeks with the result that it cured every animal. *Wochenschrift f. Thierheilkunde* No 55—'91.

THE TREATMENT OF GLANDERS WITH MERCURY.

Dr. Tizer—Wogen (*Deutsche Med. Zeitung* No. 68, 1890.

In the Berl. Klin. *Wochenschrift* Dr. Holda published lately a case of glanders in man that had been successfully treated by means of the mercury treatment. T. in his paper gives three cases that were entirely cured by the mercury treatment. Case 1. a peasant complained of pain and a feeling of heaviness in the lower extremities, headache, dullness (*Beklemmung*) and cough. Temp. was 38.9 Pulse 100. Auscultation of the lungs showed the existence

of a fine crepitant rale while percussion gave only normal sounds. On the arms and legs there existed eruptions and excrescences. The disease had existed for 8 days and the patient could not remember of having come in contact with horses. The patient was unable to give the faintest clue in regard to the disease. The bacteriological examination however did not leave T. in doubt in regard to the nature of the disease; it was glanders. As it was known to T. that the various drugs that are recommended in glanders are inefficacious, he decided to give mercury a trial. Inunctions of grey salve and a warm bath were given every two days, mouth, pharynx etc. were treated with chlorate of potassium while internally quinine was given. The excrescences or small tumors were opened and treated with iodoform and later they were treated with the Paquelin cautery to favor granulation. After the 68th inunction, in the course of three months, the patient recovered completely. One year the patient was kept under the observation of T., a recurrence of the disease however did not set in. The two other cases also terminated successfully. Dr. Wechseler reported in a Russian journal a successful mercury cure. Whether all cases will respond to the treatment as did the cases numerated above, it is impossible to say, however the results gotten in these 5 cases indicate that the mercury treatment deserves at any rate a thorough trial. *Oesterreichische Monatschrift f. Thierheilkunde*, No. 2 1891.

THE LIEBREICH REMEDY.

At a recent meeting of the Berl. Med. Gesellschaft, Liebreich made known the nature of the new panacea. We say panacea for he does not only claim that it will have a good action in tuberculosis but in every disease where there exists an altered function of the tissue cells. Liebreich noticed that the beneficial action of the Koch fluid in Lupus was preceded or accompanied by an intense cell formation. He thought it quite probable that this action was simply due to some stimulating properties of the lymph. To test the correctness of this idea he took from the shelf that ancient cantharidine that in human medicine had become enveloped in dust and oblivion, and its restoration caused no *little flurry*. The solution is made in the following manner; 0.3 hyrate of sodium and 0.2 of cantharidine are dissolved in a small quantity of water in a 1000 c. cm. flask on the water-bath. Under the influence of the heat of the water bath about 900 c. cm. of water are gradually added, then the flask removed, the fluid allowed to

cool, and the flask filled to the 1000 mark. At first he used potassium but it was soon discovered that it exerted a too decided action on the circulation and the nervous system. *L. B.*

SPANISH.

BY J. O'LEARY M. D.

SOME DISEASES OF LAMBS.

Constipation.—One of the first ailments to which lambs are liable soon after birth is constipation, not however as this condition is usually understood. The first evacuations are of an adhesive character and stick to the wool in the neighborhood of the anus, so that thereafter the poor little animal ceases to have any movement from the bowels. When a lamb is noticed to be out of sorts, and has been carefully examined, this condition of things is often found to exist. The remedy consists in washing the parts and clipping the wool around the anus. It is often found however that lambs suffer from real constipation. This may be due to the deprivation of the mother's milk, which after parturition contains purgative elements. Relaxing food should be given them instead of dry forage. If this should not succeed a little Glauber's salts may be tried.

Diarrhœa.—This disease is much more frequent among lambs than the one above mentioned. Very often the mother's milk is too strongly purgative, and for some time after birth they will suffer from profuse discharges from the bowels. This may also be due to improper food. The treatment consists in regulating the diet, taking the lamb from the mother if necessary. For some time nothing but warm milk with lime water should be allowed.

Lameness.—Lambs are liable to a peculiar and frequently fatal disease, the chief feature of which is lameness. This disease generally attacks them within the first eight months after birth. Its results are fatal to one half of the flock. Those attacked seem at first sad and, after lying down, are unable to rise again. The limbs become rigid, sometimes the front ones only; sometimes the hind ones only; at other times the rigidity extends over the entire body. Swellings make their appearance, especially in the joints. Sometimes there is an eruption in the skin of the nature of mange. Diarrhœa soon sets in quickly followed by death. The cause of the disease is not known, nor have the means of prevention or cure been ascertained. *Gaceta Medico-Veterinaria, Madrid.*

SOCIETY PROCEEDINGS.

Massachusetts Veterinary Association.—The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, March 25, 1891.

President Thomas Blackwood, in the chair. Members present; Drs. Blackwood, Bunker, Emerson, Hadcock, Howard, Marshall, Peterson, C. Winslow and the Secretary. Honorary member, Dr. Stickney. Minutes of the previous meeting were read and accepted.

Moved by Dr. Peterson and seconded by Dr. Emerson, that the Secretary act as a committee of one to attend to the details of the annual meeting and dinner. Carried. Moved by Dr. Bunker and seconded by Dr. Hadcock, that the annual meeting and dinner be held at Young's Hotel. Carried.

Dr. Bunker then read a paper to which he had not given a title. It was a plea for more brave, honest, earnest co-operation among the members of the association in doing their part in the furtherance of the public good, in spite of mercenary interests or reasons of policy, as follows:

A number of years ago when the study of veterinary science was in its very infancy in this country, in fact, I might almost say before it was born, a number of practitioners of this State, of New York, and of Pennsylvania, realizing that in co-operation and union there is strength, banded together and formed a society which is in existence to-day, known as the United States Veterinary Medical Association. To this society the members were very loyal and its meetings were regularly attended, being generally held alternately in Boston and New York.

Its members comprised graduates and non-graduates. Among the latter were many men whom any school might well be proud to claim as an alumnus—workers and students they were without a doubt, as can be testified to by many of our members.

There seems to have been one purpose which from the outset pervaded these men and for the accomplishment and advancement of which, they seem ever to have worked with an enthusiasm and interest which knew no such word as fail—they kept ever at work, their motto the advancement of the profession. To these men, many of whom have laid down their scalpel for the last time and gone to their reward, the young members of the profession owe a debt of gratitude and appreciation, for it is to such men as these that we find that opening and chance for the veterinary profession which is only of recent date. To this parent society the young men, as they took up their chosen profession, attached themselves, until at last, it became a society with members all over the Union.

Its influence has been good, its standing high, but it has not received the recognition which it should have received from the public.

As the years have passed since its inception schools and colleges have been established, and have borne their fruit until the graduate practitioner is abroad in the land.

Recognizing the fact that it is well for brothers to live together in peace and harmony, the graduate members of the profession in Massachusetts were invited to meet and form a State Society. To this invitation there was a generous response, and as a result of that gathering the Massachusetts Veterinary Association was formed. Its object, the advancement of the profession and the best interest of its members.

Its mission is a noble one and one to which every member should be loyal in heart, faithful in service, and honest in service. There is for the veterinarian of to-day, a field full of opportunities, full of chances for distinction, and last but not least, a remuneration for his time—perhaps not always a princely sum, but yet, one which will at least keep the wolf from the door. There may not always be stirring times for the investigator or specialist, but as “the still sow drinks the swill” so will the quiet but earnest worker earn the laurels when the time for action comes.

A little more than thirty years ago a Massachusetts practitioner prior to sailing from England for home, purchased one or more text books to read and study during the voyage. One of these books had some wood engravings of the pathological appearances of various diseases, which were studied with much interest. Upon his arrival home, his practice was again taken up and the books for the time, laid one side. He had not been many months at home before he was called to see a new form of disease which had broken out among our herds. On visiting the herd, a diagnosis, different from his most intimate friend's was made, and which was disbelieved both by the veterinary profession and the Human school, to say nothing of comments and criticism by the press and laity, in 1859 before the Legislature. In spite of all these sources of opposition and lack of support in his opinion, Dr. Thayer kept steadily at work until he had convinced the people of Massachusetts that they had indeed in their herds that scourage of the bovine race, Contagious Pleura Pneumonia. Firm in his opinion, persistent and untiring in his work, he finally received from his brother practitioners support and co-operation. Then the Human school and laity came over and with them the legislative

machine, and then the work of stamping out went on until there was not a case within the borders of the State. And all this had been done at a cost of about \$65,000.

I have mentioned this case thus fully for no purpose of eulogium upon Dr. Thayer, for he needs none, his work stands ever in view of such, but simply as an example to present to this society, to show them that whenever there comes a time for similar earnest work there will be given to them that support and co-operation which is requisite for the completion of the work.

This society has got among its members many who are capable of just such work, and it would be the mission, and the object of each and every member to aid in the prosecution of such efforts.

This society was not founded with the idea of simply having a sort of monthly retreat when we can get together, swap cases, chat a while, and swap stories. Its only effort should be for the best interests of the profession, strike whom it may, it may strike you to-day, it may strike me to-morrow; but as Time is the great Leveller, so, in time, will the seeming hardships be evened up. Truth, it is said, should not always be spoken. "Honesty is the best policy." They do not always seem to be from a financial standpoint, for the time-being the best move but step right ahead, and the satisfaction of knowing that your course was right and that at no future time can your course be laid bare and proclaimed dishonest, should be far more satisfactory than the few paltry debtors. Harmony is a great thing, but there is a time when it is to be put aside and the opposite condition come in its stead.

This society should lead all efforts to advance the course of veterinary medicine or the interests of the professions in this State; its voice should be heard with no uncertain sound when questions of health bearing upon our province are brought up, or are forced into prominence.

Now, should always be the accepted time, no matter if it does strike in your neighborhood, perhaps disarrange some interest, for whom you render service, temporarily, how much better to be able to say, "Yes, it did exist, but we got right to work and wiped it out," than to deny its existence or to claim that those who dare to come out are wild and crazy.

This society must do its work, must do it more earnestly, and to do it thus our members must be aroused, and now as our annual meeting is upon us let us all go to work and have a grand rally from one end of the State to the other.

After Dr. Bunker ceased reading, a pause followed which was broken by the essayist, who went on to speak of the importance of our profession, and that all of its members should work for its recognition by Boards of Health, and we should unite in expressing our disapprobation of the Cattle Commissioners' inefficiency and its having no rules for the disinfection of infected premises, dealing with suspicious cases, and the like. It is time this association was up and doing in remedying existing evils, and getting better recognition of the value of our association. Dr. Winslow said that he thought that in time, owners of animals and Boards of Health should consult veterinarians upon the best course to pursue in outbreaks of contagious animal diseases, without seeking advice from the Cattle Commissioners. Dr. Stickney thought that the Cattle Commissioners' lease of life would soon be self-terminating if it continued in its present course. Dr. Marshall thought that the members of the Commission were very reasonable in their treatment of owners of stock.

Dr. Stickney said, politeness had too much to do with their action, and it makes a great deal of difference who owns the property upon which the Commission is administering. Even if they appreciate the condition of things, which they often do not, they do not have the pluck to stand up and grapple with matters as they should. One member in particular might as well be a mop, for anyone could wring him out. Dr. Howard asked the essayist if he recommended our acting as individuals, or as an association? Dr. Bunker advised acting as individuals, but as members of the Massachusetts Veterinary Association. Dr. Howard said, that our association had investigated the Cattle Commission once, but he did not see that much had come of it. Dr. Marshall moved that the essayist be given a vote of thanks. Seconded and carried.

Dr. Hadcock reported a case of Melanosis in a roan horse. First noticed a swelling of the abdomen on the near side, one Thursday; gave a carthartic ball which acted nicely the next day (Friday), but he did not see him until Saturday. Saturday, the abdomen was very much swollen, and horse had colicky pains. Sunday morning, Dr. Blackwood saw him in consultation, abdomen was very much distended with fluid; it was proposed to tap him, but after talking it over decided not to, horse showing symptoms of Enteritis. He died Sunday night, post-mortem made Monday morning; the abdomen contained a quantity of dark-colored fluid and melanotic tumors were found in the mesentary, liver and spleen. The mesentary looked like a huge black sponge.

Dr. Peterson reported a case of fatal Epistaxis in a heifer, at Sudbury. When Dr. Peterson arrived at the farm where the heifer was owned, he found a small stream of what looked like arterial blood flowing from both nostrils; she had bled about a bucketful. He injected six ounces of tincture of perchloride of iron into her nostrils, used cold water and tried plugging, but could not check the hemorrhage, she had lost two bucketfuls of blood by the time he left, and died the next day. He did not have an opportunity of making an autopsy, but she was opened by her owner, who said that he found no lesions to account for the trouble, still a professional man might have.

Dr. Bunker spoke of a horse which came under his observation where pieces of sponge had been plugged up both nostrils to stop the noise of whistling, which it effectually did.

Meeting then adjourned.

AUSTIN PETERS, *Secretary*.

Veterinary Medical Association of New Jersey.—The seventh annual meeting of the Veterinary Medical Association of New Jersey was held at the State Street House, Trenton, N. J., on Thursday April 9, 1891.

The meeting was called to order, the President, Dr. J. W. Hawk, of Newark, in the chair. The secretary called the roll and the following members were present: Drs. J. W. Hawk, Newark; H. Bradshaw, Trenton; A. Brown, Windsor; S. S. Cole, Millville; J. C. Dustan, Morristown; J. Hurley, Hopewell; B. F. King, Little Silver; S. Lockwood, Woodbridge; W. H. Rowland, Newark; W. Runge, Newark; J. Huilson, Jersey City; R. O. Hasbrouck, Passaic; W. W. Curry, Jersey City; J. Gerth, Jr., Newark; T. De Clyne, New Durham; J. M. Everitt, Hackettstown; M. M. Stage, Dover; A. W. Axford, Naughtright; and W. H. Cooper, Trenton.

The minutes of the last regular meeting of the special meeting were read and approved. President J. W. Hawk, made an address of which the following is a synopsis:

On legislative bill, and registration; no contagious diseases in the State, not a case of pleuro pneumonia within our borders; little trouble among horses at the present time; the Bureau of Animal Industry work, giving the history of the work done in New Jersey for the last nineteen months, the number of animals killed and the cost of the same, the great work done and being done by the Bureau; and sound advice to the association for its future welfare. No unfinished business. Secretary Cooper read his yearly report which was accepted and ordered on minutes. Treasurer King read his yearly report, accepted and ordered on minutes.

The chair appointed Dr. Brown to fill vacancy in Board of Trustees. The chair declared an intermission for the Board of Censors and Trustees to make their report. President recalled to order. Dr. Dustan, chairman (Pro Tem.), made the following report. On legislative bill, also on constitution and by-laws, and advised the association to prosecute unregistered veterinarians. Moved report be received, seconded and carried. The secretary read report in full. Dr. Huilson read an essay, also Dr. King. Discussion of papers, Drs. King, Dustan, Runge, and others.

Dr. E. Britton, Long Branch, N. J., was proposed for membership, laid over according to by-laws until next meeting.

On election of officers for the ensuing year the following were chosen: President, Dr. R. R. Letts, Hoboken; First Vice-President, Dr. J. C. Dustan, Morristown; Second Vice-President, Dr. W. Runge, Newark; Secretary, Dr. W. H. Cooper, Trenton; Treasurer, Dr. B. F. King, Little Silver; Board of Censors, Dr. J. W. Hawk, chairman; Dr. W. B. E. Miller, Camden; Dr. J. Huilson, Jersey City; Dr. A. Brown, Windsor; Dr. W. W. Curry, Jersey City.

The chair appointed Dr. Dustan to escort the newly elected President, Dr. Letts, to the chair. Dr. Hawk welcomed Dr. Letts to the chair with a short address.

Dr. R. R. Letts in taking the chair made a short address, in which he spoke very feelingly of the honor bestowed upon him, and thanked the members for their esteem in choosing one of their youngest members to be their president; he hoped that he would be able to leave the chair with honor as the one who has just vacated the highest office of this association.

President Letts appointed Dr. Hawk to escort the other newly elected officers and introduce them to the association, which was followed by short addresses from each.

After considerable business was transacted, adjourned for the Banquet. Meeting recalled to order.

John O. Pitney, of Newark, was elected the counselor of the association.

The President appointed the following as Delegates to the different associations :

To United States Veterinary Medical Association, J. C. Dustan and W. W. Curry; New York Veterinary Medical Association, T. De Clyne and A. Oxford; Pennsylvania Veterinary Medical Association, J. Huilson and W. B. E. Miller; Maryland Veterinary Medical Association, W. Kunge and J. Gerth, Jr. Next meeting will be held at Newark, second Thursday in August, 1891. Adjourned.

W. H. COOPER, *Secretary*.

Keystone Veterinary Medical Association.—The regular monthly meeting of the Keystone Veterinary Medical Association, was held at the College of Physicians, Philadelphia, February 7, 1891, President, Dr. Hoskins in the chair. Drs. Zuill, Glass, Huidekoper, Weber, Kooker, Eaves, Lusson, Drake, and Schreiber, answered roll call. Minutes of previous meeting were read and adopted, after rectifying the part stating that Dr. Zuill regarded pneumonia as a trifling disease in the horse. The Board of Trustees reported as follows :

“They report unfavorably on the motion made by Dr. Ridge, of the Clinical Staff of the University, Veterinary Department; that the said Clinical Staff be expelled.” The report of the Board was accepted. Dr. Hoskins, Chairman of the Legislative Committee, reported having received the report of Counselors Alexander and Magill, regarding the amendments to the Veterinary Bill. In their opinion the law, at this length of time after its passage, is as strong as any amendment could possibly make it. In fact, they have enough confidence in the bill to offer to prosecute a violation of it, to a successful issue, or no fee. Dr. Hoskins, President, announced that for March meeting, that Dr. Huidekoper would read a paper on Meat and Milk Supply of Philadelphia, which would be followed by scientific specialists, expressing their views regarding the effect of diseased meats and milk on the health of the consumers, also the best means for protecting the interests of the dairyman. The April meeting to be devoted to the question, as to how we can procure a uniform examination of veterinary students for graduation.

Under the head of new business Dr. Zuill made some remarks upon the report of the Trustees, and tendered his resignation as a member of the Keystone Veterinary Medical Association, in which he was followed by Drs. Magill, Williams and Ridge. Dr. Magill sent his resignation as secretary, with bill for stationary, etc., all of which were referred to the Board of Trustees. Dr. Glass asked help of the members present for a veterinarian who had become stranded, an old member of the U. S. V. M. A. Dr. Hoskins made the announcement that the next meeting of the United States Veterinary Medical Association, will be held at Washington, on September 22-23, 1891. There were no papers, and on motion adjourned.

W. S. KOOKER, *Secretary, Pro Tem.*

Keystone Veterinary Medical Association.—The regular meeting of the Keystone Veterinary Medical Association was held at the College of Physicians, Philadelphia, March 7, 1891. Dr. Hoskins in the chair. The following members answered roll-call :

Drs. Miller, Huidekoper, Weber, Kooker, Bridge, Lintz, Lusson, R. Formad, Wernitz, Drake and Sellers. Present as visitors : Drs. T. B. Rayner, G. B. Rayner, J. W. Gadsden, Frank Standen, Cheston Morris, M. D., P. A. Hummel, J. R. Hart, R. Gladfelter, P. D. Keyes, M. D., State Board of Health, Dr. A. W. Clement of the staff of the Bureau of Animal Industry, of Baltimore, and George Abbott, Esq., a prominent agriculturalist.

On motion by Dr. Kooker, duly seconded and passed, it was agreed that the reading of minutes, and the regular order of business be dispensed with, and that we proceed to the discussion of the Meat and Milk supply of Philadelphia. A letter of regret from Dr. Benjamin Lee, Secretary of the State Board of Health, stating that his absence from the city would prevent his being present, was read by the Secretary as follows :

"The subject of your discussion is one of very great interest to me personally, as well as of the very first importance in its relations to the health of our people. Intelligent foreigners are amazed, when they find how little pains are taken, by our City and State Government, to protect the food supplies of the people. Whatever may be the advantage of a republican form of government, in this respect it has in this country proved itself a miserable failure. Irresponsible and conscienceless persons are permitted to adulterate and poison our food and water, almost without let or hindrance. The amount of disease and number of premature, and therefore unnecessary deaths, which take place every year in this commonwealth run far up among the thousands. The branch of this subject which your association proposes especially to deal with is one of special magnitude in its relation to infant mortality, and I cannot too heartily commend the earnest spirit in which you are taking it up." Yours, respectfully,

BENJAMIN LEE, Secretary State Board of Health.

Dr. R. S. Huidekoper was introduced and read a paper on Meat and its Inspection, illustrating his remarks on the blackboard. The earliest inspection of meat is recorded in the Pentateuch, and the code is there laid down, by which to distinguish between animals that are fit for food and

those that are not. The Romans had laws for the inspection of meat, but there were no laws elsewhere until very modern times. The large cities of Europe are very far in advance of our own. All large cities of Europe have a rigid inspection. In Bavaria and Switzerland they have a complete veterinary service for the inspection of meat. In Berlin and Paris a large force of veterinarians are employed in slaughter-houses. In Berlin all live stock shipped into the city is unloaded at a certain quarter, where it is examined by veterinarians who have no other duties. Animals are then removed to stables and reinspected and watched for a certain length of time, and are again inspected at the time of slaughter. In the case of hogs portions of each animal are sent to an office where they are examined for trichina and measles. The veterinarians employed as inspectors in the cities of Europe examine all animals in the cattle market, the live animals in the slaughter-houses and abattoirs, examine them after slaughter, and then examine the meat brought into the city that has been slaughtered elsewhere, inspect butcher shops, and inspect all meats furnished prisons and other public institutions.

In this country little or nothing has been done toward inspecting our meat supply. The alterations occurring in meat, which condemn it for use as human food, are those which are due to emaciation or loss of nutrition, want of development, and those which are due to disease altering the physical and chemical characters of the tissue. When the animal can be examined both before and after slaughter, and the symptoms of the living animal can be compared with the lesions of the cadaver, the recognition of the pernicious changes is usually easy; but when the animal has been slaughtered at a distance and only the diseased meat can be inspected, it frequently becomes difficult to determine the degree of alteration. Contagious pleuro-pneumonia should only be allowed to condemn meat when the animal has an acute fever and the meat is bloody; when the animal has a chronic inflammation, especially diarrhoea, and when the meat is emaciated; when the animal has gangrenous spots and the meat is septic. The presence of tuberculosis in an animal should condemn all its flesh, but practically only does when the disease is generalized, affects the abdominal viscera and the lymphatic glands of the whole body. When only the lungs are found affected and the lymphatic's lying under the heads of the ribs do not show lesions, the meat is usually marketable.

With the Hebrew butcher, however, any evidence of tuberculosis condemns it as Jewish food, and transfers it to the neighboring more lenient stall of the Christian butcher. Any cause which decomposes the fat on the ends of the cut bones or on the surface of the meat favors the beginning of decomposition and attracts flies, and septic germ's to hasten putrefaction. The essayist went very minutely into the anatomy of the bullock to choose choice meats from and the reasons therefore. The paper was able and should be in print, it received much applause. Dr. P. S. Keyoes of the State Board of Health, said that there was no meat inspection in the city, but that the milk inspection was progressing very favorably, under the very weak law that we have, and of which dealers will take advantage. Dr. A. W. Clement, of Baltimore, spoke of the progress in meat inspection in Montreal,

Canada, where for a time, strictness was required of the butchers, but insufficient appropriation allowed of nothing of a permanent character.

He showed the need of public abattoirs, the want of which was a cause for the evil system prevailing. In Baltimore especially, he said, there was a lack of any proper inspection of milk or meat. Dr. W. E. B. Miller, of the Bureau of Animal Industry, referred to the restrictions enforced by Great Britain on animals shipped from their ports, and thought that a careful examination would contribute to the raising of the embargo. Since Nov. 1st. 10,781 cattle had been examined here, of which number 144 were diseased and 123 had tuberculosis. He has discovered that the meat of tuberculous animals is largely used in the lower section of the city for making bologna sausages. Dr. Miller stated that in New Jersey the number of tuberculous animals is on the increase. Dr. W. B. Wernitz, stated that when he was a Member of Councils he succeeded in having a system of inspection passed. The inspector was called a Market Clerk, and inspected the meats and the weights and measures. But through the efforts of farmers' and market people they had been abolished by an act of the legislature, since which time, we have no standard of weights in our market, nor any inspection of meat. This action on the part of the legislature was approved by our present Governor. Dr. J. Cheston Morris referred to the work of the milk inspector here, whom he considered as well qualified, but who, in order to attain the best results, must be enabled to visit the dairies, and there examine the animals from which milk is sold. Dr. F. Bridge believed that every herd and every dairy in the State ought to be inspected. The inspection in this State is deficient for the reason that while there are about \$90,000,000 worth of cattle, the entire appropriation for their inspection amounts to \$2,500.

Mr. George Abbott, a prominent milk dealer, being called upon for his views, expressed pleasure that this subject was brought up for discussion and action. Physicians, said he, want 50 per cent. or more water added to the milk for the use of infants. This he said is not a matter of much concern, but the removal of cream is, as the latter could not be readily detected. The speaker thought that statements made in the *Press* were calculated to prejudice the people against the present milk supply. He knew of men who would not keep a tuberculous cow were the fact shown to them. He would welcome the passage, by the legislature, of a bill enforcing inspection of herds and guarding the public against all risks.

Dr. J. W. Gadsden, introduced as a veteran in this branch of veterinary science, expressed his opinion about tuberculosis which he said was found in animals largely in Illinois, Pennsylvania and other States. He individually did not drink milk at his home except when boiled. He said England would not raise the embargo on American cattle while a single case of pleuro-pneumonia exists in the United States.

After further discussion the subject was on motion of Dr. Huidekoper continued for another meeting.

On motion adjourned.

W. S. KOOKER, *Secretary*, Pro Tem.

Keystone Veterinary Medical Association.—The regular meeting of the Keystone Veterinary Medical Association was called to order at the College of Physicians, Philadelphia, on April 4, at 8 p. m. Dr. Hoskins in the chair. The following members answered roll call :

Drs. Bridge, Weber, Hoskins, Goentner and Drake. The minutes of previous meeting were read and adopted. The President in absence of a quorum of the Board of Trustees appointed Drs. Goentner and Drake, to act with Dr. Weber on the resignation of Drs. W. L. Zuill, W. H. Ridge, Chas. S. Williams and C. H. Magill.

The Board reported as follows : We hereby report that we recommend the acceptance of the resignations of Drs. W. L. Zuill, W. H. Ridge, Chas. S. Williams and C. H. Magill. Signed, S. E. Weber, M. W. Drake and Chas. T. Goentner.

It was moved and seconded the above be adopted. Carried.

Dr. Hoskins asked if mares have an increase in temperature during the period of gestation. Dr. Bridge answered that he had noticed an increase of two degrees for the first two months, Dr. Hoskins stated that at seven months his mare had a temperature of 101 1-5 and continued about the same until parturition. Dr. Bridge said cattle always have a rise of temperature during gestation.

Dr. W. H. Hoskins read a paper entitled "The Necessity of a Uniform Standard and Title of Veterinary Medicine in America," (Vide page 209.)

The essayist desired that the Keystone Association should be among the first to advise a single standard of examinations in veterinary medicine, and placing itself on record in this direction; he thought other associations would do the same and the colleges would ultimately make recognition of it and extend their course to at least three sessions. Dr. Goentner was doubtful if we could in any way influence the schools. Dr. Glass, who had been called to the chair, took this opportunity of assuring the association, that the Veterinary Department of the University of Pennsylvania, was always desirous of retaining the good will of the profession and did not wish at any time or in any way to run counter to the best views of veterinary associations.

The recent move taken by the officials of that Institution was purely a personal matter and not a college feeling.

Dr. Weber was glad that the Keystone Veterinary Medical Association was the first to advise the adoption of these measures, but could not see how it can be carried successfully to an end. And in recognizing the higher standard of the University of Pennsylvania, wished that others should have the same. He asked, are the graduates of Agricultural Colleges recognized by the United States Veterinary Medical Association as regular graduates? Dr. Hoskins answered him yes, that they were admitted to membership at Chicago, September 17, 1891.

Dr. Bridge thinks the step a desirable one but difficult for the association to express its opinion to the colleges for a higher standard of requirements.

Dr. Weber advised the State joining the Colleges in taking this step.

Dr. Goentner recommends a body of qualified men to start a National Board of Examiners and not to allow recent graduates to enter unless they

can pass the Board, if the different associations would join and work together the point might be attained.

Dr. Hoskins said the people can be reached through public opinion; that the schools will not listen to the Keystone Veterinary Medical Association but would if all the societies would join and work for the same point. If the Keystone Veterinary Medical Association would adopt a rule and not admit a member unless a three years' course had been pursued he would vote for it.

Dr. Glass gave his views of the matter, that it should be a National Board of Examiners and not a State matter, as it would get into politics and favors be shown in granting the positions. We should get the veterinarians at large interested, to push it and keep at it.

Dr. Glass then explained the numbers of the University of Pennsylvania graduates as smaller compared with the Canadian schools to be the result of the three years' course. He thought it would be advisable to stamp out all the schools and form a limited number of Government Schools the same as in Germany inasmuch as the veterinarian is the preventor, and the physician, the cures of disease.

Dr. Goentner made a motion that a committee be appointed to draft suitable resolutions, embodying the views of the Keystone Veterinary Medical Association on the subject of a higher standard and a single board of examiners. Seconded by Dr. Hoskins. Passed.

The President appointed the following committee: Drs. Glass, Chairman; Goentner and Weber. Election of officers; the secretary's place now being vacant, Drs. Kooker and Drake were proposed; Dr. Kooker's name being withdrawn at his own request, Dr. Drake was elected by acclamation.

The meeting then adjourned.

W. H. HOSKINS, *President.*

M. W. DRAKE, *Secretary.*

VETERINARY COLLEGE NOTES.

New York College of Veterinary Surgeons and School of Comparative Medicine; Commencement.—The 34th annual commencement of the New York College of Veterinary Surgeons and School of Comparative Medicine, was held at Chickering Hall, March 5, 1891. The hall was filled to its utmost capacity by an interested audience. Conterno's 9th Regiment Band furnished music. The President of the College accompanied by the Trustees and Faculty, took the platform, and immediately following them the graduating class filed in and occupied the first four rows of seats; the following three rows being occupied by Juniors who were entitled to certificates.

Dr. Harry D. Gill, Secretary of the Faculty, presented to President Wm. T. White, M. D., the names of those students who had complied with all necessary legal requirements and had passed a satisfactory examination,

and he, after duly obligating them, conferred upon them the degree of V. S., as follows :

R. Lindsay Tritton, Boonton, N. J.; John D. Deal, Charleston, Mo.; James Haley, Jr., Hamilton, Scotland; Pleasant H. Browning, Virden, Ill.; Robert P. McDougall, Wilmington, N. C.; Edward Plummer, Jr., M. D. Baltimore, Md.; Wesley F. Strong, Washington, D. C.; Edgar Chambers, New York City; James H. Ferster, New York City; August C. Hassloch, New York City; Robert N. Manney, New York City; Robert J. McNair, New York City; Charles E. Caulfield, New York City; James H. Mullen, New York City; James H. Lawler, New York City; William H. Brooks, Brooklyn, N. Y.; John J. Curran, Brooklyn, N. Y.; Louis J. Meinck, Brooklyn, N. Y.; Charles F. Moadinger, Jr., Brooklyn, N. Y.; Charles E. Anderson, City Island, N. Y.; D. Edgar Smith, Manhasset, N. Y.; James B. Shearer, Pittsford, N. Y.; William J. Doyle, Auburn, N. Y.; Thomas S. Childs, Troy, N. Y.; William Stinson, Chelsea, Mass.; Edwin P. Henderson, Chelsea, Mass.; Charles S. Moore, Plainville Mass.; Monroe B. Miller, Old Line, Pa.; Harry K. Miller, Mannheim, Pa.; William B. Collom, Doylestown, Pa.; E. Michener Massinger, Chalfont, Pa.; Morris M. Downs, West Chester, Pa.; Robert J. Fox, Bryn Mawr, Pa.; Henry S. Christy, Philadelphia, Pa.; Harry F. Albright, Allentown, Pa.; Edward J. Young, Media, Pa.

Prof. C. B. Michener, awarded the following prizes :

Gold medal for best general examination, August C. Hassloch; Silver medal for best Junior examination, W. H. Wilson. The Comstock Prize, a Pocket Case of Instruments, for best anatomical preparation, R. Lindsay Tritton; Jenkin Prize, Set of Standard Veterinary Works, for best written Thesis, C. F. Moadinger, Jr. The Reyling Prize, an Emergency Valise, for the best paper on *Materia Medica*, Edgar Chambers. The Valedictory address was delivered in a masterly and impressive manner by Dr. Harry F. Albright.

Rev. J. B. English, D. D., M. D., was then introduced to the audience, and his address, sandwiching scientific facts with equine anecdotes, kept the audience in alternate states of profound interest and mirthful demonstration. The floral display embraced many beautiful and unique designs.

The graduating class and invited guests, repaired to Martinelli's for a spread, at which the following toasts were given :

The New York College of Veterinary Surgeons; Prof. H. D. Gill; the Veterinary Profession, Prof. C. B. Michener; the Class of '91, Dr. Jas. Haley; Our Guests, Prof. Carroll; the Medical Profession, Prof. H. M. Biggs; The Press, Dr. C. C. Catenach; Human and Veterinary Medicine, their corelation and their common interest, Prof. Geo. A. Lyons; Dr. J. H. Ferster, Toast Master.

Class Officers.—Edgar Chambers, President; John D. Deal; Vice-President; Pleasant H. Browning, Secretary; J. H. Ferster, Treasurer.

Executive Committee.—M. B. Miller, Chairman; J. Haley, Secretary; Wm. Stinson, Chas. E. Caulfield, Morris M. Downs.

HARRY D. GILL, *Secretary.*

McGill University. Faculty of Comparative Medicine and Veterinary Science; Commencement.—The convocation of the Faculty of Comparative Medicine and Veterinary Science of McGill University, was held in the William Molson Hall, in the presence of a large audience. In the centre were the students of the various years and surrounding a number of ladies and their other friends.

At three o'clock Mr. J. W. Erakenridge, B. C. L., Registrar of the University, entered with the Chancellor, Sir Donald A. Smith; the Vice-Chancellor, Sir William Dawson; Dr. D. McEachran, dean of the Faculty of Comparative Medicine and Veterinary Science; the professors of the faculty and the members of the Convocation and the graduating class.

Among those who occupied seats on the platform were Dr. Stewart, of the medical faculty; Mr. J. J. Curran, Q.C., M. P., and Mr. John W. Gadsden, M. R. C. V. S., of Philadelphia.

Prof. McEachran, dean of the faculty, delivered a very short and pithy address. He pointed out that the accumulation of wealth marked the progress of a nation, and that McGill was rapidly becoming famous abroad. To what more useful purpose could the merchant princes put their money than to endow a seat of learning? McGill had much to be thankful for in this respect, but the Faculty of Comparative Medicine had been left to struggle alone.

Sir William Dawson, conferred the degree of V. S., on the following, in order of merit :

Geo. E. Macaulay, T. C. Simpson, T. B. McDonald, C. M. Higginson, S. S. Twombly, A. W. Gorham, D. B. Comstock, D. St. Louis, John Watson, Frank Barton, D. McDonald, Geo. A. Miller, John A. McCrank, Geo. Townsend.

Prizes were awarded as follows :

Veterinary Medicine and Surgery, George E. Macaulay; Anatomy, Thomas E. Simpson; Diseases of Cattle, D. B. Comstock; Chemistry, J. D. MacIntyre; Physiology, J. D. MacIntyre; Histology, Wilfrid Plaskett; Materia Medica, J. D. MacIntyre; Botany, Wilfrid Plaskett; Zoology, M. C. Wylie. For the best general examination on all subjects, (silver medal), Sidney S. Twombly; Second prize, (book), John A. McCrank.

The following gentlemen were awarded the degree as graduates of the late Montreal Veterinary College, who have been found to have complied with the regulations governing the granting of the degree to such :—

IN ABSENTIA.

Paul Paquin, Bacteriologist and Professor of Veterinary Science, Agricultural College, Columbia, Mo.; A. R. Rowat, Chief Veterinarian to the Government of Honolulu, S. I.; Peter Cummings, Lecturer of Anatomy, Quebec Veterinary College; John Robertson, Veterinary Surgeon, 2nd. U.S. Cavalry; John Ryan, Lecturer Chicago Veterinary College, Chicago, Ill., U. S.; Charles R. Simpson, Charlestown, Mass.; James B. Paige, Lecturer on Veterinary Medicine, Amherst Agricultural College, Amherst, Mass.; Archibald A. Keys, Minneapolis, Minn., U. S.; and Edward C. Crevier, Peterborough, Ontario.

After the Valedictory by Dr. McCrank, Dr. John W. Gadsden, of Philadel-

phia, was introduced by Sir Donald Smith, as being the first gentleman to make a valuable donation to the Faculty. Mr. Gadsden said he had watched the program of the Veterinary College for six years and was fully aware of the ability of the teaching staff of the college. Having collected a library, including a complete set of the Veterinarian, and a museum and intending to retire from active life, he was glad as an Englishman to donate them to the Faculty, and he expressed the hope that it will receive endowments that will enable it to keep pace with the other faculties.

Mr. J. J. Curran, M. P., delivered an address to the graduating class. Sir William Dawson in making the closing remarks expressed himself as being heartily in sympathy with the work of the Comparative Medicine Faculty, but one thing he did not like was the present premises occupied by the Faculty. He hoped that in the near future they would be able to secure more commodious class-rooms and laboratories, and a hospital for the treatment of animals. His remarks were warmly applauded by the students present.

Ontario Veterinary College; Commencement.—The Ontario Veterinary College closing exercises were held on Saturday morning, March 28th, in the spacious lecture hall of the fine new building on Temperance street. The Students filled the body of the hall, and the number of visitors in attendance was very large. Prof. Andrew Smith, principal of the college, presided, and beside him on the platform were: Hon. Edward Blake, Hon. A. S. Hardy, Lieut.-Col. F. C. Denison, M.P., Hon. J. B. Robinson, Mayor Clarke, Joseph Tait, M.P.P., Col. Otter, Capt. Manley, Rev. G. M. Milligan, Dr. Daniel Clarke, Sheriff Mowat, Dr. Ferguson, ex-M P, ex-Ald. Frankland, Harry Piper, Archibald Blue, Capt. McMaster, Ald. Saunders, Ald. Score, Dr. O'Reilly, Dr. Thorburn and Henry Wade.

The list of graduates was read by Dr. Duncan, and Hon. Edward Blake, in presenting the first prizes expressed himself as being very much interested in the success of the college. Much of the wealth of Ontario lies in stock, Mr. Blue put the value of the horses and cattle down at \$100,000,000. He impressed on the students the great responsibility laid on their shoulders of looking after the welfare of so much wealth.

Addresses were also given by Hon. A. S. Hardy, Hon. J. B. Robinson, Lieut.-Col. Denison, M.P., Joseph Tait, M.P.P., and several others of the visitors. Many of the students at the college are from the United States, and this fact was made the subject of happy comment.

After the presentation of prizes Mr. A. C. Keelor, of Harleysville, Pa., chairman of the graduating class, in an eloquent address, presented Prof. Smith with an exceedingly handsome picture of the graduating class of 1891. Prof. Smith, in reply, thanked the students most heartily for this token of their appreciation of the curriculum and teachings of the college. He also spoke with feelings of regret at parting with a class that certainly has not been excelled in any previous year.

The board of examiners consisted of Mr. Cowan, V.S., Galt; Mr. C. Elliott, V.S., St. Catharine's; Mr. A. O. F. Coleman, Ottawa; J. D. O'Neil,

V.S., London; W. Shaw, V.S., Dayton; J. H. Wilson, V.S., London; T. H. Lloyd, V.S., Newmarket; C. H. Sweetapple, V.S., Toronto; James Thorburn, M.D., Toronto, and were assisted by C. W. Sallade, V.S., Pottsville, Pa.

The following received the degree of V. S.: John E. Alexander, Mascouche Rapids, P. Q.; M. T. Anewalt, Pleasant Hills, Ohio; Edward Appleyard, Grand Valley, Ont.; David T. Augustine, Calton, Ont.

Frank M. Barnes, St. Thomas, Ont.; J. W. Barr, Milverton, Ont.; H. M. Hatchelder, Warrensburg, Ill.; G. H. Bellaire, Pembroke, Ont.; James T. Boothby, Altona, Ont.; Hamilton Bowen, North Fairfield, Ohio; Percival T. Bowlby, Port Dover, Ont.; C. W. Brossman, Lower Heidelberg, Pa.; Alexander H. Brown, Pipestone, Minn.; Bruce E. Brown, St. Catharines, Ont.; William A. Brown, Pipestone, Minn.; Robert M. Bryan, Lexington, Ky.; William M. Burdick, Grovesend, Ont.; S. G. Burkholder, Denver, Pa.; Samuel Burkholder, Virden, Man.; Jame C. Bromeson, Mansfield, Ohio.

Anderson Crawforth, Brampton, Ont.; E. H. Callander, Kirkton, Ont.; Lewis W. Carl, Campchase, Ohio; William E. Carnes, Greenwood, Ind.; William R. Claussen, Waupaca, Wis.; Walter C. Clevenger, Union City, Ind.; E. J. Cobleigh, Parkhill, Ont.; S. J. Collins, Green River, Ont.; Vilroy M. Connelly, Owatonna, Minn.; Wilson S. Corliss, Carthage, N. Y.; Eli M. Crawford, Brampton, Ont.; John P. Creamer, Regina, N. W. T.; Wilton F. Crewe, Hillsboro, North Dakota; W. J. Cunningham, Parkhill, Ont.; Louis M. Cole, Toledo, Ohio.

James Drury, Toronto, Ont.; Lewis Dunn, Jr., Erie, Pa.; Joseph H. Dietz, Owatonna, Minn.; Charles E. Edmonds, Fingal, Ont.; James Cicero Everest, Arkona, Ont.; Alex. Findlay, Toronto, Ont.; George M. Fitzgerald, Chiselhurst, Ont.; J. E. Foster, Mount Eaton, Ohio; Albert A. Frank, Great Valley, N. Y.; Byron M. Freed, Sharon, Pa.

John A. Genung, Slaterville Springs, N. Y.; James Mitchell Gibb, Kingston, Jamaica, W. I.; Duncan R. Gillies, Moffat, Ont.; Whitfield Gray, Newton, N. J.; W. C. Galbraith, Brampton, Ont.; Charles H. Hackett, Linwood, Ont.; John M. Hagerman, Lynedoch, Ont.; D. C. Hanawalt, Frankfort, Ohio; J. A. Hanisch, Lake City, Minn.; J. E. Hodgins, Mooresville, Ont.; E. Burwell Holmes, London, England; J. H. Honan, Delphi, Ind.; Arthur George Hopkins, London, England; Richard Harrison, Bad Axe, Mich.; John A. Jobson, Franklin, Pa.; Herbert J. Johnston, Jasper, Ont.; Joseph B. Johnston, Gallipolis, Ohio.; Elisha K. Kane, Warren, Ill.; William Kaul, St. Mary's, Pa.; Allen Z. Keelor, Harleysville, Penn.; James S. Kelley, Irving, Ill.; Robert L. Kelley, Irving, Ill.; Peter J. Kershner, Bernville, Pa.; Joseph E. King, Palmyra, Ill.; Joseph Brady Kinter, Marion Centre, Pa.; J. W. Klotz, Arcadia, Ind.; Foster J. Kyle, Cedarville, Ohio.

A. J. Lamberson, Whitehall, Wis.; D. C. Langford, Mason City, Iowa; Henry C. Lyon, Grandon, North Dakota; David Lewis, Omemee, Ont.

Clarence McLennan, Greenwood, Ind.; Uri Burtton McCurdy, Hutchinson, Kansas; R. A. McLoughry, Wolseley, N. W. T.; W. H. McLaren, Fargo, North Dakota.

Robert McDonald, Emerson, Man.; Alex. Machan, Mitchell, Ont.; H. L. Marsack, Tunbridge Wells, Eng.; George W. Moore, Burgessville, Ont.; Andrew Smith Morrison, Bristol, P. Q.; Thomas Morrissey, DeWitt, Iowa;

John Joseph Mountford, Blenheim, Ont.; W. H. Moyer, Pottsville, Pa.; H. M. Manley, Arkansas City, Kan.

George C. Neale, Parkhill, Ont.; W. G. Neilson, Battleford, N. W. T.; W. A. Nixon, Brampton, Ont.; Hubert A. Ovens, Maple Lodge, Ont.

D. Augustus Platt, Lexington, Ky.; Charles F. Palmer, Wooster, Ohio; A. L. Parker, Providence, R. I.; J. G. Parslow, Clarinda, Iowa; James A. Pendergast, Phoenix, N. Y.; Edmund C. Porter, Waterford, Pa.; Albert R. Potteiger, Bernville, Pa.; J. O. F. Price, Sibley, Iowa; William H. Pullen, Lebanon, Ohio.

Jackson Rhodes, Uxbridge, Ont.; Theodore S. Rich, Avon, N. Y.; George Robb, London, Ont.; Ralph B. Robinson, Brooklin, Ont.; John W. Rollings, Lancaster, S. C.; Nathaniel Robinson, Dresden, Ont.; J. L. Ronan, Auburn, N. Y.; Alexander Sanson, Petrolea, Ont.; W. H. Shadwell, Burgess Hill, Sussex, Eng.; Charles Shain, London, Ont.; Victor W. Shirley, Watford, Ont.; Septimus Sisson, Manhattan, Kas.; Alexander Esdale Smith, New Perth, P.E.I.; Richard H. Smith, St. Mary's, Ont.; William Spence Stinson, Orangeville, Ont.; Mark A. Storey, Princeton, Ill. John B. Sowers, Greencastle, Pa.

William R. Taylor, Winnipeg, Man.; Thomas Thacker, Portage du Fort, P.Q.; Sherman L. Peeple, Napoleon, Ohio; Joseph A. Thompson, Elginfield, Ont.; Samuel Thompson, Roseneath, Ont.; S. F. Tolmie, Victoria, B.C.; W. George Turner, Point Edward, Ont.; Joshua P. Thomson, Upper Grove, Ont.; Frederick Tilt, Brampton, Ont.

Delo Vanderslice, Salem, Ohio; George B. Vliet, Hackettstown, N. J.; Hugh F. Vulliamy, Ipswich, England.

Ernest J. Walsh, Oakville, Ont.; Ulysses E. Ward, Overton, Neb.; W. J. Wadsworth, Hurray, Ont.; A. H. Wilson, St. Mary's, Ont.; Joseph E. Williams, Fingal, Ont.

The following prizes were awarded:

Pathology.—First prize, S. Sisson, silver medal; second prize, A. G. Hopkins; third prize, A. Z. Keller.

Materia Medica.—First prize, W. S. Corliss; second prize, William R. Claussen; third prize, S. G. Burkholder.

Chemistry.—First prize, J. H. Gibb; second prize, A. G. Hopkins; third prize, Harry Harsack.

Morbid Anatomy.—First prize, S. Sisson; second prize, W. J. Wadsworth; third prize, A. E. Hopkins and E. B. Holmes, equal.

Anatomy.—First prize, silver medal, S. Sisson; second prize, S. G. Burkholder; third prize, E. Appleyard.

Dissected Specimens.—Gold medal, given by Toronto Industrial Exhibition Association, awarded to Eli H. Crawford; second prize, E. J. Walsh; third prize, W. A. Nixon; fourth prize, F. C. Porter. Special prizes—J. Burneson, D. C. Gillies, R. E. Stevenson, W. J. Wadsworth.

Entozoa.—Prize, A. G. Hopkins.

Physiology.—First prize, silver medal, S. Sisson; second prize, R. H. Smith; third prize, H. F. Vulliamy and W. J. Wadsworth, equal.

Best General Examination.—Jas. S. Kelly, Oregon, U.S., gold medal, presented by the Ontario Veterinary Association.

Bacteriology.—First prize, W. J. Wadsworth; second prize, S. Sisson.

Prizes for essay on Bacteriology.—First prize, Harry Harsack; second prize, E. Burwell Holmes; third prize, A. G. Hopkins.

Special prize presented by Mr. W. Christie, Trustee of Toronto University, to student taking the greatest number of prizes—Complete set of Darwin's works—S. Sisson.

Special prize books presented by John Hoskin, Q.C., Trustee of Toronto University.

Physiology.—First prize, S. Sisson; second prize, R. H. Smith; third prize, H. F. Vullainy and W. J. Wadsworth, equal.

BOOKS AND PAMPHLETS RECEIVED.

Original Research in relation to Annual Economics. A Socialistic study by Frank S. Billings, M. D. Rep. from Times and Register. 1891.

Annual Report of the Presbyterian Eye, Ear and Throat, Charity Hospital. Baltimore, 1891.

Über Hufkrankheiten und ihre Behandlung von Prof. E. Hess. Thiermedezinesche Vorträge. Bd. 111, Heft 3-6, herausgegeben von Dr. Georg Schneidemuhl. Leipzig Arthur Felix. February 1891.

Verhandlungen des naturhistorischen vereines der preussischen Rheinlande, westfalens und des Reg. Bezirks Osnabrück Bonn. 1890.

Verhandlungen der K. K. Zoologisch-botanischen Gesellschaft in Wein. Bd. XL. Q. 3-4. 1890.

Bericht des Naturwissenschaftlichen Vereins in Augsburg. 1890.

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Bulletin de la Société Zoologique de France. Paris, 1891.

Bulletin de l'Académie Royal de Médecine de Belgique. T. V. No. 2.

Anales de la Sociedad Científica Argentina, Buenos Aires, 1891.

THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES.

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JUNE, 1891.

No. 6.

THE OXWARBLE OF THE UNITED STATES.

BY COOPER CURTICE, VETERINARIAN.
Moravia, N. Y.

So much has been written, and I may add re-written, concerning the Oxwarble that it would seem that we should now know all about these wonderful pests. I must confess that my astonishment was as great as anyone's when I found, it is now three years since, that comparatively little was known about this, the commonest cattle parasite.

On March 14, 1891, I placed a number of grubs taken from the hides of slaughtered cattle, under favorable conditions for metamorphosing. Within two days some of the darkest colored assumed that peculiar form which indicated that histolysis had begun. About noon April 16, two flies, a male and female, had emerged from two of the cases.

An analytic comparison of these flies with Brauer's (1) description determined these to be *Hypoderma lineata* Villers. Through the kindness of the Curator of Entomology of the U. S. National Museum, Prof. C. V. Riley, I have, with his able assistant, Mr. Th. Pergandi, compared these bred specimens with the fourteen specimens in that collection, and especially with the specimen identified by himself (5), and the distinguished dipterologist, Mr. S. W. Williston. They proved to be of the one species, *H. lineata*. There were slight differences between the sexes in color, length of hair, breadth of forehead, size of abdomen, etc., but these were sexual.

As *Hypoderma lineata*, Villers, is but little known in this country, a review of the little literature at hand concerning its occurrence in the United States will prove of interest.

1863. Brauer (1) records *H. lineata* from Kentucky, from an adult in the Imperial Museum, Vienna.

1875. Brauer (2) describes and figures a larva *H. Bonassi*, taken from the back of a buffalo in Colorado.

1886. An observer (3) records the grub of 'heel-fly' as a native of Texas, and as having certain differences from *H. bovis*, and details life history.

1886. Williston (4) records *H. lineata* from Northern California and Arizona from specimens in his collection.

1887-88. S. O. Cotton (5) records a connection between the heel-fly and the grubs of cattle-backs.

1889. Riley (6) identified a specimen sent to him by W. F. M. Dickson, Milford, Texas, as *H. linearis*, Villers, and connects this species with the 'heel-fly' of Texas.

1890. Brauer (7) describes specimens of grubs taken from cattle in Europe as larvæ of *H. lineata*, for the reason that adult *H. lineata* were taken in the vicinity and no other larval form was known. He also connects these larvæ with *H. Bonassi* and cites the occurrence of adult *H. lineata* in America.

1891. Holstein* (11) records, April 25th, rearing the Texas Heel-fly.

1891. Curtice (12) records May 9th. the epitomizes life-history of the Heel-fly. The writer (present article) rears two specimens, a male and female, of *H. lineata* from the cattle grubs taken in Washington, D. C.

The expected outcome of *Hypoderma lineata* from the cattle grubs has been indicated to me by the following facts :

1. No adults of *Hypoderma bovis* have ever been recorded as captured in this country, all have been *H. lineata*.

* To the untiring enthusiasm and scientific tastes of Mr. George Wolf Holstein, a well-known ranchman of Albany, Texas, I am indebted for a specimen of *Hypoderma lineata*, hatched April 15, 1891, which he has reared from the larval stage, secured from an animal on his ranch. He states that the grub metamorphosed in about twenty days, and having shown it to numerous fellow-ranchmen, also adds, that they agree with him that the fly is the well-known and dreaded heel-fly. While I do not now propose to give my line of reasoning, I take pleasure in stating that all facts that have come to me demonstrate this most completely.

2. No original figures of *H. bovis* drawn in this country, have yet appeared.

3. All American writings concerning the cattle-grubs have evidently been drawn from European sources together with figures; and few actual observations of biology or of detailed anatomy of adult or larva have been made.

4. Of five hundred specimens of matured larvæ in the Bureau collection, from the North Eastern United States, all vary but little among one another, resemble the larva described by Brauer (2) as *H. Bonassi*, and present specific differences from the descriptions of the larva of *H. bovis*. For the last two years my search has been for larvæ of *H. bovis*, which is said to be so plentiful throughout the country.

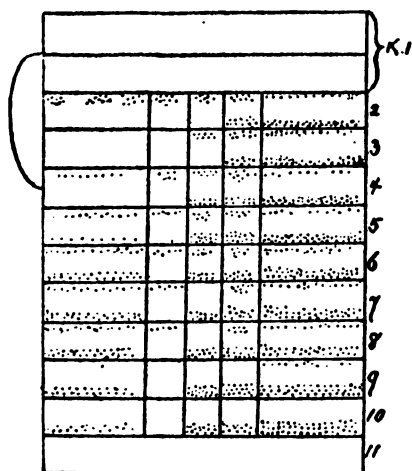
Besides other characters the principal one separating the larva of *H. bovis* from *H. lineata*, is the complete absence of spines from the tenth segment and from the ninth, excepting the ventral area in the former, while in the latter these segments carry spines, especially on their caudal edges.

Diagrams showing the exact relations of Brauer's (6) *H. bovis* (Fig. a) and *H. lineata* (Fig. b) to the American species, (Fig. c),

are introduced, for the use of future observers. These diagrams really present the characters better than any description, or any other kind of figures. They are due to the ingenuity of Prof Brauer, and are so complete that I gladly adopt them, as I am sure others will in turn whenever describing this class of insects.

In the first column are the spines of the dorsal area; in the second, of the dorso-lateral; in the third, the lateral; in the fourth the ventro-lateral and in the fifth, of the ventral. Each column is further sub-divided into

FIG. A.



HYPODERMA LINEATA VILLERS.
After Brauer.

twelve horizontal divisions, each representing a segment of the larva, and the first two, the cephalic, being counted as one. The

spines are indicated by dots placed in the cephalic and caudal portion of these rings as they occur on the grub.

In comparing these diagrams it will be seen that the varia-

tions between that of *H. Bonassi* (Fig. i), and the American *H. lineata*, (Fig. k) and the European *H. lineata* are less than between either and *H. bovis* (Fig. l).

About a year ago I published (7) an account of the life-history of the larvæ *Hypoderma bovis*. I must confess that I was not then dealing with *H. bovis*. I had not at the time complete data for establishing the new species and preferred to present the matter under the accepted name for the species.

I regard the life-history of *Hypoderma lineata* to be as follows: The adult fly lays its eggs somewhere on cattle presumably the back, by attaching them to the hairs. This attachment is admirably outlined by the structure of the egg, (Fig. d) which is similar to that of the horse bot-fly *Gastrophilus equi*, and by the structure of the ovipositor, which is not adapted for boring. While some authors have contended that the egg is laid in the skin others have conclusively shown that this is not the case.

Development takes place within the egg while yet

FIG. B.

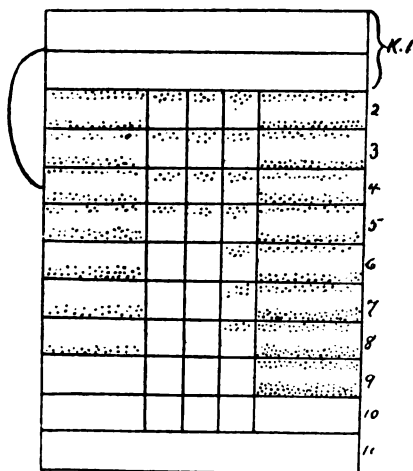
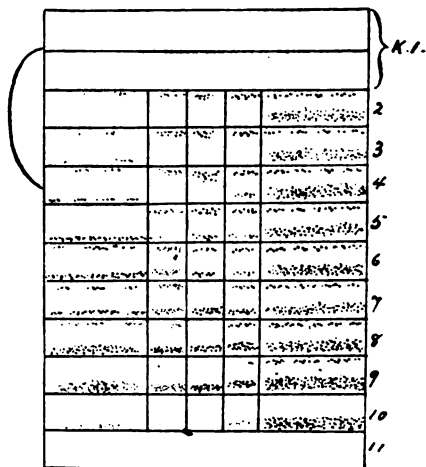
HYPODERMA BOVIS,
After Brauer.

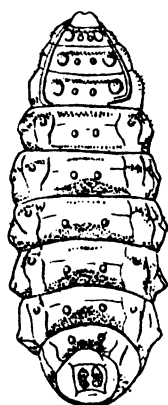
FIG. C.

HYPODERMA LINEATA VILLERS.
Haines, original.

attached to the hair, as demonstrated by the late Dr. Handlirsch

FIG. K.

FIG. I.

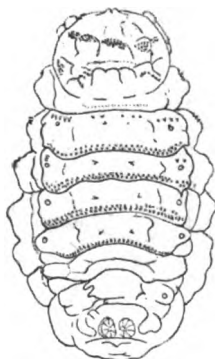


HYPODERMA BONASSI.
After Brauer.



HYPODERMA LINEATA.
Haines, original.

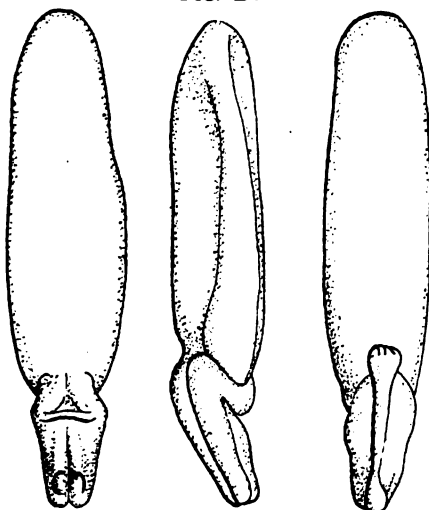
FIG. L.



HYPODERMA BOWIS.
After Brauer.

(7) whose figure of the larva within the egg case (Fig. e), Dr. Brauer so clearly described.

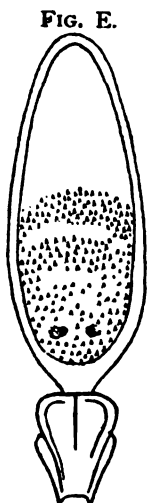
FIG. D.



EGG OF HYPODERMA LINEATA.
Haines.

From this point on my version of the life-history varies from that of others until the larva has arrived at its destination in the cysts, under the skin which open to the air through the hide. As it becomes necessary to designate the different stages through which the larva passes, names for our present use must be adopted. The first stage as shown by Brauer (7) is undoubtedly the form that emerges from the egg-shell—the oval-larva. The next known stage is that found

in the œsophagus, the œsophageal (Fig. *f*), whether this stage may be shown to be different from the oval or whether intermediate stages may be found is yet to be proven. The œsophageal stage is identical with the subcutaneous and with the first form found in the skin tumors. So as not to confuse the three stages found in the skin by giving them different names from those used in my earlier article (7) we may call the three stages the first, second and third cutaneous stages.



LARVAL *HYPODERMA LINEATA* IN
EGG SHELL.
After Handlirsch.

It has been stated by various authorities that the young grub emerging from the shell bored its way through the skin until it reached the subcutaneous tissue, and thus made its channel. From circumstantial evidence I believe that the embryos are licked by the cattle and swallowed, or lodged in the back of the mouth or œsophagus. This theory is based on the appearance of the cattle grubs in the walls of the œsophagus in November, long before they

are found in the backs of cattle in this locality. Later, about Christmas time, the grubs appear suddenly, and in full force under the skin of the back.

At their first appearance under the skin (Fig. *f*), they are as large as those found in the œsophagus at that time and differ in no wise from them. By the latter part of January or early in February all have disappeared from the œsophagus together with all traces of inflammatory action in that organ so observable in January.

He stated in the above cited article (7) larvæ had been found next the eleventh rib on the thoracic side; also by Huirichsen (9) in the spinal canal; in subcutaneous muscles, Brauer (1), and in subcutaneous connective tissues by myself (8). I have, in addition, found Nov. 7, 1890, a specimen in the connective tissues immediately adjacent the spleen. Twice have wounds in the œsophageal muscular coats occurred to me, which I believe to

FIG. F.



HYPODERMA LINEATA.
Haines.

have been caused by the larvæ while penetrating it. A year ago I discovered some small spots which seemed to me to have been gnawed on the underside of freshly removed hides, which also carried the larva in the first cutaneous stage. This season I have not found any, all of the grubs having completed their tunnels.

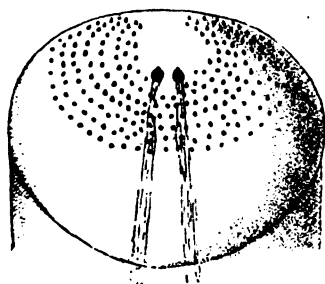
The earliest grub holes that I have been able to find are very uniform in size corresponding with the calibre of the grubs contained in them, and had no appearance of the sac which forms later. The walls were rough as if gnawed, and the hole was cylindrical, to near the epidermis, when it suddenly contracted. Now, the freshness of the wound and the absence of inflammatory action, is a very good index of the recent date of the wound, for when the wound is exposed to the air germs are sure to enter, a sac grows and secretes pus. Were the wound of a more remote date it would be of quite another character, as every Pathologist will admit.

Just preceding the time when one is able to find the young warbles in the skin, that condition known to butchers as "lick" appears. The "lick" is nothing more than an effusion of serum into the connective tissue membrane, and is produced by the inflammation set up by the wanderings of the young grubs. This effusion can also be found in the walls of the œsophagus, just prior to the final disappearance of the grubs. The disappearance of the "licks" from the tissues underlying that portion of the hide most infested, the saddle, is followed by finding the grubs in sacs in the first and second cutaneous stages. When the sacs are well formed the "licks" have disappeared.

These "licks" are said by farmers and butchers to be caused by cattle licking themselves. It is, easy to understand, however, that the cattle lick themselves at this time on account of the irritation produced by the grubs in piercing through the sensitive skin. The appearances of "lick" in those parts where the force of the tongue could not reach, as in the œsophagus, an appearance which has been my guide to the grub and its vicinity, is quite good proof that the grubs cause "lick."

The grubs bore through the skin caudal end (Fig. *g*), first. This end is best provided with

FIG. G.



HYPODERMA LINEATA.
MARX.

the proper apparatus for tearing the skin fibres—numerous rows of short, stout spines. These, Fig. *e*, Brauer (1) has figured and

Ormerod (10); Brauer (7) figures spines on the ovalarva, by which the young larva enters the œsophagus, caudal end first. It is true that there are a few spines and two hooks on the head (Fig. *h*), in the earlier stages but these are insignificant as compared with those of the caudal end.

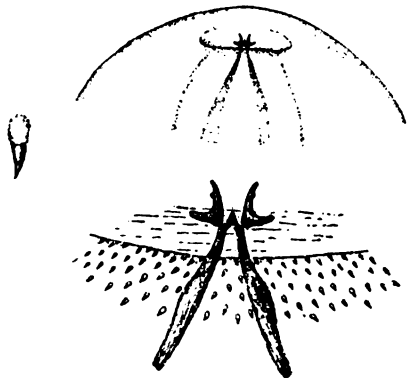
Having made its tunnel through the hide the larva moults. The differences between the first and second cutaneous stages also adds another proof to strengthen

the net of circumstantial evidence pointing out this life-history. The breathing pores of the first cutaneous stage are quite small and no larger than in the œsophageal stage or subcutaneous. The stigmal plates of the second stage, however, are much larger and the respiratory tract quite plain. This indicates that while there may have been limited respiration in the early stages, that so soon as the grub reaches to the air a larger respiratory apparatus is not only necessary, but it acquires it.

The difference in the food between the subcutaneous stage and the first cutaneous stage, or certainly the second stage, is quite marked. Before the tunnel is made or completed the contents of the alimentary canal are yellow, like the inflammatory effusion it excited, but after the sac forms, after it looses the mouth hooks in the second stage, the contents become much darker like the pus secreted from the lining membrane of the sac.

The different stages of the larvæ in the skin cysts can be easily connected by dissecting out the whole cysts, marking their contents, and finding the moults of the earlier stages. Miss Eleanor Ormerod, of Torrington House, St. Albans, England, Consulting Entomologist of the Royal Agricultural Society, has figured and described the three cutaneous stages of *H. bovis*, and published the most practical economic work of anyone; and I am indebted to her for a series of her valuable writings on this subject.

FIG. H.



HYPODÈMA LINEATA.

Haines Marx.

On completing the larval stages of its life the grub forces its way out through the narrow hole by means of vermicular contractions and the stout spines. Falling to the ground, it may force its way into some crevice or under the edge of some adjacent object, and then passes into its pupul state. The specimens I bred occupied six weeks in transforming. There were bred by Mr. Holstein about three. Metamorphosis completed, the mature fly emerges through the hole left by a cap splitting, from the side of the head end.

Fortunately, the female-fly was detected in the act of laying an egg, Fig. *d*, the attaching portion of the egg came first. The time of deposition, the exact place or places of deposition, and the discovery of larva less than 7 mm. in length have yet to be investigated.

The results of this paper were obtained while prosecuting investigations upon the animal parasites of cattle, while I was in the employ of the Bureau of Animal Industry, Department of Agriculture. If of value, they show the importance of employing specialists to work up the life-histories of cattle parasites, and continuing their work through a series of years, or until it becomes fairly well demonstrated that they cannot be pursued further profitably.

The material is in the Bureau collection. It consists of over 200 oesophageal grubs; 45 of the first, 150 of the second and 550 of the third cutaneous stages. So far but three flies have been bred. I am indebted to Dr. D. E. Salmon, the Chief of the Bureau, for the use of material, and for drawings of which I have had copies made.

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10. Ormerod, Warbles of Cattle, 11th. Ann. Rept. p. 116, and other reports.
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THE PREVALENCE OF TUBERCULOSIS.

BY DANIEL D. LEE, M. D. V.

Instructor in Anatomy, Veterinary Dept, Harvard University.

In the March number of this JOURNAL for the year 1890, I published an article on the Present Attitude of Veterinarians on the Subject of Tuberculosis, in which I took the ground that the present method of wholesale slaughter of all cattle that were tuberculous, was not only going to be ineffectual in stamping out the disease ; but that it was also an unjustifiable destruction of property, because no steps are taken to quarantine human beings suffering from the disease.

In the past year various wild statements have been made about the frightful prevalence of tuberculosis in American cattle ; and these statements certainly tend to needlessly prejudice European countries against American beef.

The only statistics on tuberculosis that I know to have been compiled, and which include *different classes* of cattle, are those given in the report of the Board of Health of the City of Boston for 1890. These statistics are furnished by Dr. Alexander Burr, Inspector of Meat at the Brighton Abattoir. All the pathological specimens that he obtains are carefully examined by him, under

the supervision of Dr. William F. Whitney, at the Harvard Medical School.

I give the tables below (that refer to tuberculosis):

CLASS OF ANIMAL.	NUMBER.	TUBERCULUS.	PER CENT.
(1) Whole number of all kinds of cattle.....	28,296	54	0.19
(2) Cows from Eastern States.....	1,153	52	4.5
(3) Oxen.....		1	
(4) Western Cow.....		1	
(5) Old cows sent to dead-house, which have died in the city and its neighborhood.....	116	12	10.3

From this table we find that the percentage of *all kinds* of cattle tuberculous is astoundingly small, $\frac{1}{50}$ per cent., less than a $\frac{1}{5}$ of one per cent. Next we find that one ox was tuberculous and only one Western cow. The Eastern cows $4\frac{1}{2}$ per cent.

Finally comes the last class of the cows coming from Boston and vicinity to the dead house. These cows belong to the class of "milk machines" that are said to be tuberculous as high as 35 per cent. and 50 per cent., and even in them we find it only $10\frac{3}{10}$ per cent.

Dr. Burr then calls attention to Dr. Michener's report in regard to the cows from about the city of New York. He finds in 5,000 cows, 1,379 unthrifty cows, of which 11 per cent. were tuberculous, and of the remainder four to five per cent. Now Dr. Burr and Dr. Michner both came very near each other in their estimate, and careful statistics of this sort are certainly of more value than statements of percentage based on the examinations of a few herds of "milk machines," for the reasons, first; that such cattle do not represent the condition of *all* the cattle in a State or Country; and secondly, that no statistics of the prevalence of tuberculosis are of the slightest value unless based on post mortem examinations, the diagnosis in life being often impossible as is well known.

The use of Koch's lymph as a diagnostic agent in bovine tuberculosis would of course make the diagnosis of the disease possible during life in doubtful cases, but unfortunately the

reaction which follows the use of this material cannot be relied upon. This has been proved by its use on human beings. Numerous experiments have been made on cattle with Koch's lymph, in Europe, and it seems from the reports of these experiments that I have read, that the reaction is even more uncertain in cattle than in people.

It has been said that Dr. Burr's statistics are not to be taken as a fair average for the state, because "coughers" would not be sent to the abattoir, where they would have to be inspected, but to some sausage factory. I have a report from the same source extending from October, 1889, to April, 1890, which gives an account of the first six months of Dr. Burr's work, before the public became aware that a careful inspection was made at the abattoir. I give it below :

Total number of cows and steers killed,	
from October to April, - - -	15,506
Percentage tuberculous, - - -	$17\frac{1}{2}$ per cent.
Eastern cows, tuberculous, - - -	$3\frac{1}{2}$ "

$17\frac{1}{2}$ per cent is very near $18\frac{1}{2}$ per cent of the last report, but a *little lower*, this does not look as if greater care was taken to send tuberculous cattle to other slaughtering establishments, and $3\frac{1}{2}$ per cent of Eastern cows is lower than the last report, which is $4\frac{1}{2}$ per cent.

The dead horse statistics are especially valuable. I give Dr. Burr's opinion in his own words.

"I may add in connection with the foregoing, that in connection with the Abattoir, we have an establishment where fertilizers are manufactured and dead animals of all kinds received, such as horses and cattle, many of which are cows; these animals represent a fair average of the cows of our neighborhood; having died, the owners have seldom any disposition to hide them. I have examined all the cattle brought here and so far, my record is as follows :"

Received dead cows at Abattoir from Oct. 1, '89 till	
April 1, '90, - - -	80
Number found with Tuberculous lesions, - - -	6
Percentage, - - -	7.5

No better opportunity, it seems to me, could be found to reach a fair average of the extent to which the disease prevails among our animals.

In this last table we find $7\frac{1}{2}$ per cent and $10\frac{3}{8}$ per cent in this year's report. Now all the percentages are larger for the past year than during the last six months. From them we can say that about $\frac{1}{8}$ of one per cent. of *American cattle* are tuberculous. That *milch cows*, being kept in confinement and therefore liable to tuberculosis, are affected as high as 4 or 5 per cent. That, unthrifty milch cows, used as "milk machines," badly fed or housed, run as high as 10 to 11 per cent. Don't let us forget that $\frac{1}{8}$ of one per cent. is the average for the country, this 2 in 1000. European statistics say 5 in 1000; we are better off than they are. To get a very high per cent. like 35 or 50 per cent. a report like this must be made.

"I examined a herd of sixty cows and found *four* cases of tuberculosis, *twenty* suspicious and *six* slightly suspicious, making in all 30 cases!" Now this is 50 per cent, but how many of these cows really have tuberculosis, perhaps five? Post mortem examinations are not made to back up such reports, and what are they worth?

NAIL WOUND OF THE FOOT.

SYNOVITIS, SEPTIC INFECTION, DEATH.

BY A. W. CLEMENT, V. S.

Subject: — A bay gelding seven years old used for carriage purposes.

CLINICAL HISTORY:—The animal stepped upon a nail in the street while being delivered to the buyer by a man in the employ of the seller. The shipper missed the boat and on his return was about three rods from the stable when the accident happened. The stable men could not remove the nail so called in a blacksmith. The blacksmith had considerable difficulty in getting the nail out. When removed it was found that the nail had passed into the foot to the depth of nearly two inches. From the way in which the nail was bent it had evidently passed upward and slightly backward. The nail entered the near hind foot by the side of the frog at about the beginning of the posterior third.

The blacksmith pared the foot down, and by direction of the seller a poultice of cow manure was applied. At the request of

the buyer I visited the animal three days after the accident happened. I found the animal standing on three legs, apparently suffering great pain. Pulse 60 and very full. Temperature 101° . Respiration 22. The animal was eating well and had full control over the muscles of the jaw.

I removed the bandage and cleaned the foot. There was some swelling and considerable heat just above the hoof. After paring away more of the sole and frog, the wound at the base of the foot was exposed. A probe could be introduced into the wound to the depth of an inch. The parts were irrigated with corrosive sublimate solution 1 in 1000, then dressed with iodoform and several layers of wood-wool and absorbent cotton, and the whole enclosed in a moist crinolin bandage. The dressings were changed daily. The discharge of pus from the wound was very slight but there was a constant escape of synovia. The tissues became very œdematous, the swelling extending for some distance above the hock joint. The temperature on the second day was 103° and on the third day 106° at which point it remained until death. Abscesses formed just above the coronary band and, later, around the fetlock joint. Sinuses led from the abscesses above the coronary band to the coronary and pedal bones and finally became so large that one could easily pass his finger into the coronopedal articulation. The animal lived for twelve days after the accident happened.

Post mortem. Examination of the foot. As it was impossible, for want of time, to make a full post mortem examination of the animal, the leg was sawn through midway of the large metatarsal bone and a vertical incision made through the foot and the part of the leg attached. It was seen that the nail had passed through the edge of the fatty frog, into the navicular joint, and through the navicular bone into the coffin joint. The edges of the opening through the navicular bone were quite irregular. There was intense reddening of the articular surfaces of the navicular, pedal and coronary bones. The articular surfaces were smooth, however. The primary wound communicated freely with the sinuses leading from the abscesses just above the coronary band.

THROMBOSIS OF THE ILIAC ARTERIES.

BY DR. J. HUILSON.

We very seldom hear of cases of Thrombosis, and it would appear from this to be a very rare disease in actual practice. Personally, I have but little experience and that, only with a few cases in the live animal, but in the dead subject in the dissecting rooms we find it different. I think while at college, that about one out of every twenty of the horses used for dissection, exhibited thrombosis, and that too in vessels in most instances of considerable size.

One case I remember was found in the Post. Aorta near its origin, but the majority of the cases occurred in that vessel at its termination, or involving the Iliac arteries, the Museum of the college also contained many interesting specimens of this disease. It seems to me therefore from its frequency in these dead subjects that during life, the trouble must frequently remain unrecognized and probably be the cause of lameness or disease. I will briefly consider the pathology of Thrombosis or Embolism as it might occur in any blood vessel, and then give the symptoms as exhibited especially when affecting the Post. Aorta or Iliac Arteries.

Regarding the pathology, Williams says, that a thrombosis is the coagulation of the blood in the vessels be it arteries or veins. It may proceed from inflammation of the vessels, caused by some injury, the result of this being an exudation from the walls of the vessel, forming the nucleus of the clot. The formation of the coagulum always begins at some definite fixed spot which is the source of local irritation and from this, it extends, until the artery is plugged up to its origin from the parent trunk. Portions of this clot or thrombus may often become detached from the walls or valves of the blood vessels, and be impelled onward to other parts of the circulation, these are termed embolic thrombi and may be impelled from the heart to the arteries or may form in the veins and travel to the heart. As long as the thrombus is confined to a branch vessel, there is no particular danger. The greater number of thrombi in the small branches do not content themselves with advancing up to the level of the main branch, but new masses of coagulum deposit themselves in the blood upon the end

of the thrombus. Layer after layer the thrombus is prolonged beyond the mouth of the branch into the trunk in the direction of the current of the blood, and shoots out in the form of a thick cylinder, farther and farther, becoming continually larger and larger. It is these prolonged plugs that constitute the source of real danger, as the stream of blood may detach minute portions, hurry them away with it and wedge them tightly into the nearest system of arteries or capillaries. Thus many cases of sudden death that would otherwise be unexplainable are accounted for. Now regarding the symptoms. These thrombi of internal blood vessels in many cases would be impossible to recognize during life. We may have a suspicion of the trouble, but not sufficient to give a positive diagnosis. Perhaps externally, from the decreased amount of blood supplied to the part, we may detect more or less atrophy of the muscles supplied by such vessels. Thrombosis of the Iliac Arteries, the vessel supplying the circulation of the posterior extremities, however, may be recognized both by symptoms plain to the sight and by examination internally. I will endeavor to present these symptoms as shown when affecting these vessels in speaking of thrombosis. We understand of course that the blood vessel is not entirely plugged by the clot, the blood being able to trickle in most cases between the coagulum and the coat of the vessel and if both sides are affected the symptoms would be shown in both extremities.

The history of these cases will run about as follows : A horse apparently sound in every respect, when driven for a short distance, develops symptoms of lameness a weakness or slight paralysis behind, which will increase until unable to make further progress. During this time, he will break out in profuse perspiration over his body, the leg is kept in constant motion alternately raised and lowered, in a spasmodic manner. Respiration is hurried, pulse very weak and the horse seems in great pain. Another marked symptom, is on feeling the leg below the hock we find it to be of an icy coldness. If you continue to urge him, he may fall down, and after resting or lying a certain length of time he will get up and when brought to the stable stands and rest, and the symptoms disappear, however, to reappear upon the same exercise. As long as he is in the stable he shows no symptoms, but when the circulation of the blood is increased by exercise the spasm or cramps of the muscles and irritation again develops. The lameness resembles, and when first seen, might easily be mistaken for spavin, walking on the toe as in hock lameness.

The disease may sometimes, also with hasty diagnosis, be mistaken and treated for Azoturia or colic, but with such a history, a patient showing these symptoms every time he is driven or exercised, and recovering after rest, the profuse perspiration and cold extremities, the Veterinarian will be led to suspect the real trouble, and the diagnosis can be easily confirmed by an examination, per rectum. Inserting the hand into this organ searching for these large blood vessels which will be found situated beneath the last lumbar vertebra, we can feel the hard or cordy vessel and the loss of pulsation, or a fluttering sensation as of a small stream passing through a narrow space. The difference between that and the healthy artery will confirm our diagnosis.

Treatment. There is nothing I know of that will avail in this trouble. Perhaps a mild case might be found where attempts may be made to cause absorption of the clot, assisted by medicinal agents, such as iodide of potash, mercurials or alkalies, or turning out to pasture trusting to nature. But I have not yet heard of any successful treatment.

FERRETS.

After hunting with a ferret examine his feet. If any cuts or bruises appear, or nails are pulled off, wash the parts with vinegar, salt and alum; otherwise the wound may spread till the animal is covered with the scab. Foot-rot is prevalent and highly contagious among animals kept in filthy hutches. A good home remedy is to rub the feet and toes with sulphur and lard, or sulphur and sweet oil, till the rot is softened, after which wash the feet with carbolic soap. One or two applications of pyroline oil will effect a cure. Sweats are common to young ferrets that have been too closely bedded. If they are weaned, wash them with carbolic soap and give them good food. As a rule, ferrets cannot be doctored successfully. If they seem to be ailing without apparent cause, change their food; also put a little sulphur in their milk two or three times, and give them a new apartment. Fleas may be driven off by the use of insect powder or carbolic soap.—

G. W. FELTERY.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

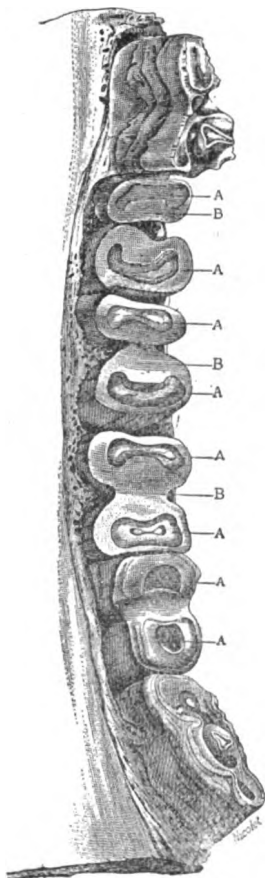
BY R. S. HUIDEKOPER, M.D., VET.

[Continued from page 231.]

MOLAR TEETH.

As in the case of the incisors the irregularities of the molar teeth are due to excess and deficiency of length. This may occur on one, or both sides of the jaw, on all of the tables of an arch, or only on certain teeth.

FIG. 71.



LOWER MOLAR ARCH OF A VERY OLD HORSE.

DEFICIENCY OF LENGTH OF THE CROWN.

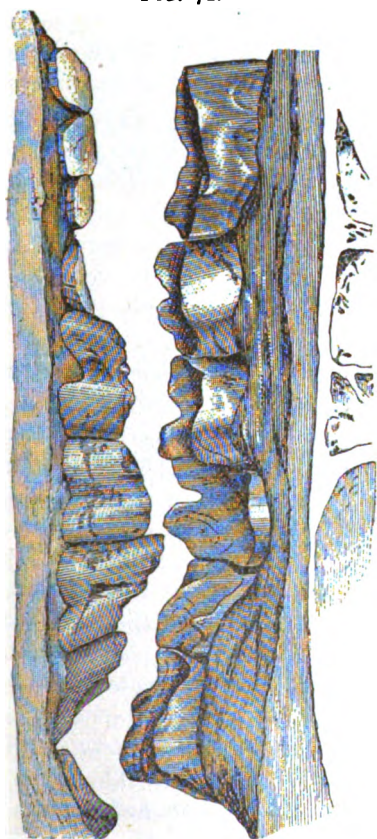
Inferior Jaw.—The abnormal use of the molars rarely extends to all of them in an arch; sometimes those in the centre of the arch are the most worn (Fig. 71), giving it a concavity, in which the corresponding elongated teeth of the upper jaw fit; or, sometimes they are worn most at the extremities of the arch, with an inverse condition of the upper jaw (Fig. 72); in molars which have been excessively worn the crown may have disappeared, leaving the roots as distinct and apparently supernumerary teeth (Fig. 71). In this case, as was noticed in the study of the structure of teeth, when they are worn down, they produce an irritation of their alveolar cavities, which causes an excessive deposit of calous bone or cement, which unites them together, and aids them in their function, but sometimes causes annoying bony tumors; but the new function is not as complete as the original one, as the hard enamel has disappeared, and the wearing surface is much softer; the mastication is not complete, and the animal shows the effect of a lessened nutrition.

Superior Jaw.—What has been said of the lower jaw applies to the upper, but the changes in them are less frequent. The separation of the roots in the upper jaw is less common, as these teeth are longer and contain a greater amount of enamel.

EXCESS OF LENGTH OF THE CROWNS.

Excess of length of the crowns or portions of them is of rather common occurrence. As the upper molars are broader

FIG. 72.



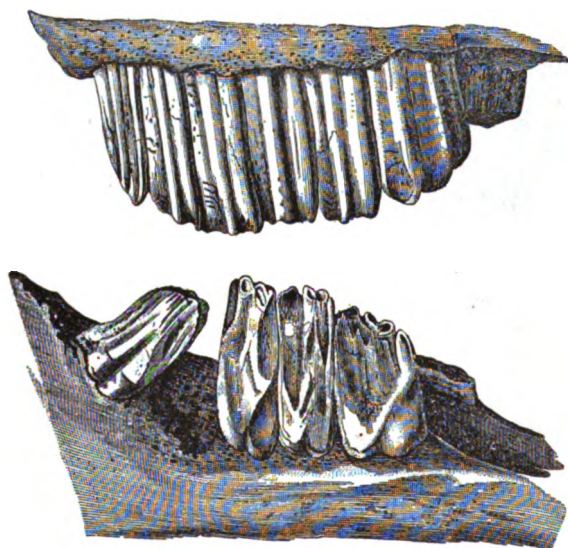
MOLAR ARCHES (RIGHT) OF A VERY OLD HORSE.
Lower jaw to the left of figure.

as well as longer than the lower ones, the lower jaw is obliged to have a lateral movement in order to grind against the whole table of the former. When the horse is fed under the ordinary conditions of nature, finding coarse weeds, twigs, hard vegetable matters and resisting substances, as dirt, etc., mixed with its food, this lateral movement is rendered complete by the slowness and difficulty of mastication, and the teeth are kept worn evenly. When, however, the animals are given selected fine hay, cleaned oats and slops and mashes, easy of mastication, they use the jaws like a chopping machine, and all parts of the grinding surfaces are not brought into contact. Again, when horses, like cab horses, doctors' hacks, etc., are fed at irregular times and in a hurry, they masticate incompletely, give the jaws but little lateral movement, and the narrower,

lower jaws wear only against the internal portion of the tables of the upper teeth. When from any cause, such as caries of a tooth, cementoma, disease of any kind or deformity, the animal chews

more on one side than the other, the normal bevel of the teeth, throws the wearing surfaces from their natural position and while some portions are worn faster, others do not receive the proper amount of use. When one or more teeth have been partially destroyed or lost, the opposing teeth, finding lessened resistance, become excessive in length, and frequently irregular in shape. The irregularity of shape from any of the above causes is usually in the form of an increased bevel; only the internal surface of the

FIG. 73.



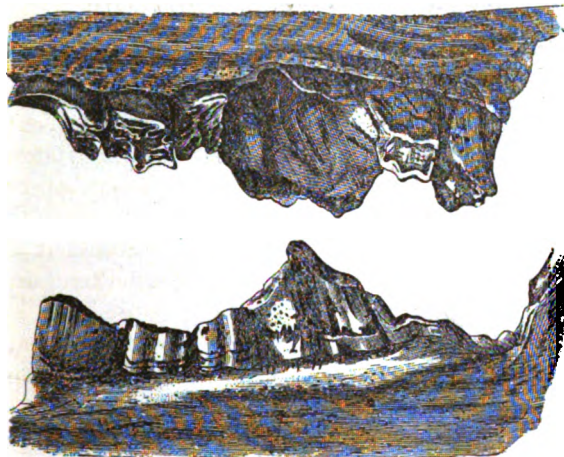
IRREGULAR WEARING OF UPPER AND LOWER MOLARS.

upper molars is worn, causing the formation of a little ledge along their outer borders, this acts as a check to lateral motion of the lower jaw, soon prevents it altogether, and cause and effect soon react on each other. The external borders of the upper jaw become long, thin, and sharp, and their irregular

ragged edges cut the cheeks and serve as lodging places for balls of food, which may decompose, causing further irritation to the mucous membranes. The internal borders of the lower teeth may become very long and stand up like so many arrow points, cutting the tongue, and even penetrating the hard palate. The pressure on the border of the teeth worn close to their roots, and the lateral pressure due to the leverage of the crown on its root, in the alveolar cavity, produces further irritation and prevents proper mastication; the pain on one side frequently confines the grinding entirely to the other. The loss of the lateral motion also prevents the slight fore and back play of the arches of the teeth, and soon the anterior edge of the first molar above, and the

posterior edge of the last molar below, grow into points, which may be very annoying to the animal; removal of the latter is troublesome to the surgeon. Disease of a molar in one jaw, or its absence from fracture or otherwise, is soon followed by complication in the opposing tooth of the other jaw. Fig. 74 shows a fourth molar in the upper jaw with a cavity which was the size of a hen's egg, into which points the fourth inferior molar (elongated). The presence of a dental cyst probably explains the

FIG. 74.



HYPERTROPHY OF THE UPPER FOURTH MOLAR (RIGHT), WITH CAVITY FOR ELONGATED CORRESPONDING MOLAR,

enlargement of the upper tooth and also the softness of its texture, which allowed it to be worn hollow.

Irregularity and deformity of the molars is the cause of much constitutional trouble; the interference with the mechanical action of the jaws, and the soreness produced in them, and in the

cheeks and tongue renders trituration of the food and mixture with saliva incomplete, the unprepared food is not digested and assimilated properly, causing a defective nutrition, the animal falls away in flesh, becomes hide bound, and may have attacks of indigestion. The non assimilation of the food causes indigestions and atony of the digestive tract and predisposes to intestinal calculi. The molars of all stable-fed animals should be looked to once or twice a year, including those of race colts which are grain fed from weaning. The inspection of the molars should constitute a part of examination for soundness.

[TO BE CONTINUED.]

RECENT PATENTS

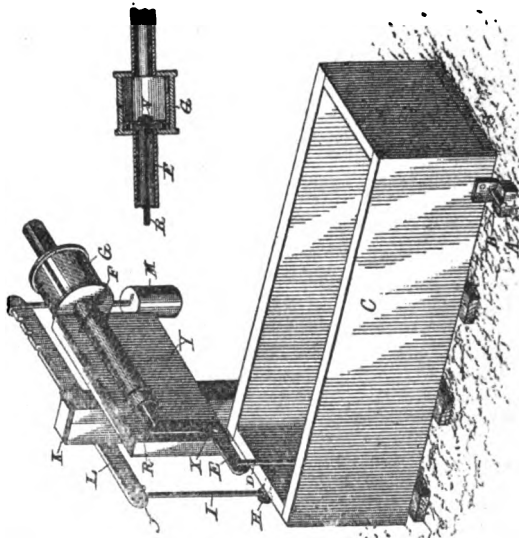
RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

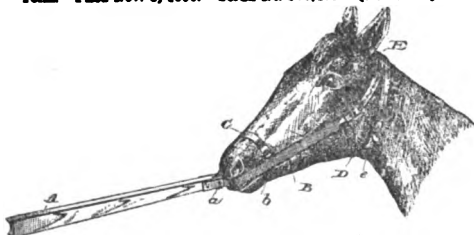
Issued by U. S. Patent Office for Month ending May, 1891.

Claim.—A water-trough comprising the following parts in combination: a water-trough pivotally mounted at its forward end, a weighted lever connected with the rear end of said trough, the cylindrical tube G, connected with a source of water supply, a waterpipe extending from said tube toward said trough, an elbow-lever having its lower end connected with the rear end of said trough, a valve in said tube, and a rod connecting together the upper end of said elbow-lever and said valve.

450,170. WATERING-TROUGH FOR STOCK. WILLIAM L. MAGER, Bethany, Mo. Filed Apr. 8, 1890. Serial No. 247,187. (No model.)



450,525. ANIMAL-POKE. JOS. F. PHILLIPS, Weakley County, Tenn. Filed Nov. 6, 1890. Serial No. 370,470. (No model.)

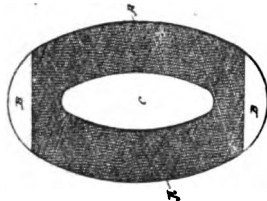


Claim.—1. In an animal-poke, the combination of the poke bar A, the upper end of which is bifurcated for the reception of a pivoted spur-wheel, and rigid or metallic cheek or side pieces B, secured at an upward inclined angle to the poke-bar and provided with openings b b and c c for the reception of straps

C, D, and E, substantially as set forth.

2. In combination with a poke-bar A, pivoted spur-wheel a, and rigid cheek or side pieces B B, said cheek or side pieces having openings b and c, nose-strap C, throat-latch D, and strap E, having members e e, said straps being adapted to retain the poke upon the head of an animal and limit its play, substantially as set forth.

450,486. FOOT-RASP FOR HORSES. GILBERT TOMPKIN, San Leandro, Cal. Filed July 17, 1890. Serial No. 369,072. (No model.)



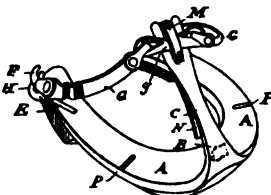
Claim.—1. A foot-rasp comprising a bar having a rasp-surface shaped to cover the whole tread of the hoof, an aperture to clear the frog, and means for grasping and operating it arranged in the plane of the bar, as set forth.

2. A foot-rasp comprising a bar having a rasp-surface on one face, and a file surface on the other, shaped to cover the whole tread of

the hoof, an aperture to clear the frog, and means for grasping and operating it arranged in the plane of the bar, as set forth.

Claim.—1. The shoe **450,622. HORSESHOE** CHARLES J. JUTSON and FREDERICK A. POUPARD, London, England. Filed Aug. 13, 1889. Serial No. 330,632. (No model.)

proper having hooks at its respective heel ends and a toe-pillar in front and constructed with tread-studs in the form of ridges upon the upper tread, one of which is placed transversely immediately behind the toe-pillar, one radically on each flank, and two diagonally near the heel ends, these last-named tread-studs converging to a point at the front of the shoe, combination with side bands and connections interlocking with said hooks and with the upper end of said toe pillar, substantially as and for the purposes described.



2. In a nailless horseshoe, the combination of a toe-pillar provided with a spring at its inner base, with a tread-stud placed immediately behind the said pillar to effect the locking of the shoe upon the hoof, substantially as described.

3. In a nailless horseshoe, a toe-pillar constructed with a bifurcated upper end and with a pliable central prong located in front of the fork and adapted to be upset rearwardly into the intertine space of the fork, in combination with a fastening-band crossing said fork behind said central prong, substantially as described.

4. In combination with a fastening-band having eyes at its rear ends, the shoe proper constructed with laterally-projecting hooks at its heel ends to engage with said eyes, and projecting ridges which project laterally below the respective hooks, substantially as described and shown.

5. In combination with a fastening-band and suitable connections, and shoe proper constructed with tread-studs in the form of ridges located on the top tread near the heel ends and converging toward the front part of the shoe, substantially as described and shown, for the purpose set forth.

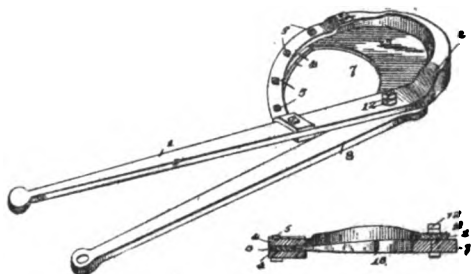
450,650. HOPPLE HIRSH TWINE, Erie, Pa. Filed Aug. 30, 1890. Serial No. 312,223. (No model.)



Claim.—The combination of the leg-straps having the forward end secured to a loop, a neck-strap the ends of which are secured to a loop supporting a plate B, said plate B having a tongue or shackle B1, pivoted at one end to the plate, which is also provided with a catch-lever engaging with the free end

of the tongue or shackle B1, and releasing-cord secured to said catch-lever.

451,049. CATTLE-DEHORNER. ASA W. HINDMAN, Chester, Mebr.
Filed Jan. 30, 1891. Serial No. 373,434. (No model.)



bolts passed through the plates and packing, of the cutting-member pivoted to the guiding member immediately below its curved end, a crescent-shaped knife extending from the cutting member at one end and riding at its outer end between the clamping-plates, and the inner end of the cutting member terminating in a handle, substantially as specified.

Claim.—1. In a cattle-dehorner, the combination, the inner end of which terminates in a handle, the upper end of which is laterally curved and thickened to form an abutment, a pair of clamping-plates connecting the curved end with the member below its curved position, a yielding packing interposed between the two plates, and a series of adjusting-

Claim.—1. A toe-weight **450,826. TOE-WEIGHT FOR HORSES.** HENRY B. LOWE, Des Moines, Iowa. Filed Aug. 30, 1890. Serial No. 363,535. (No model.)

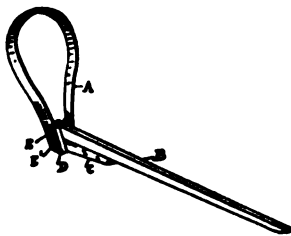
for horses, consisting of a clip adapted for permanent attachment to the hoof of the horse and having series of ratchet-teeth, a weight, and a spur adapted for attachment to the weight and having ratchet-teeth which mesh with those of the clip when the parts are adjusted, as and for the purposes stated.



2. A toe-weight for horses, consisting of a clip having embracing-arms on which are formed ratchet-teeth, which clip is adapted for permanent attachment to the hoof, a weight, and a spur removably secured to the weight, having ratchet-teeth which mesh with those of the clip when the parts are adjusted on the hoof, as and for the purposes described.

3. A toe-weight for horses, consisting of a clip having embracing-arms and ratchet-teeth formed on said arms and adapted for permanent attachment on the hoof, a weight, and a spur adapted to and held upon the weight by an adjusting-screw, said spur having ratchet-teeth which mesh with those of the clip when the parts are adjusted on the hoof, as and for the purposes set forth.

450,758. ANIMAL-YOKE. JOSEPH H. MONTGOMERY, Lecon, Ill., assignor of one-half to Anthony Hacker, same place. Filed Dec. 18, 1889. Serial No. 334,331. (No model.)

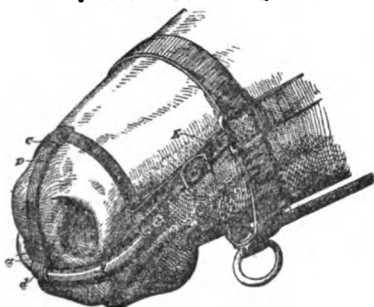


extremities by means of a pin or bolt, and a brace C, pivotally secured thereunder by a pin, the rear or pivoted end of the poke-rod B extending slightly beyond the pivoted end of the said brace C, for the purpose herein set forth and described.

Claim.—1. In an animal-poke, a neck-yoke or collar A, having a poke rod B pivotally secured between its lower extremities by means of a pin or bolt, and a brace C, pivotally secured by a second pin immediately below the said poke-rod and between the said projections, substantially as and for the purposes set forth and described.

2. In an animal-poke, a neck-yoke or collar A, having a poke rod B pivotally secured between its lower

451,655. VETERINARY INHALER. HENRY T. WELCH, San Jose, Cal. Filed Sept. 5, 1890. Serial No. 364,075. (No model.)



Claim.—1. An inhaler for horses, consisting of a hollow medicine-receptacle having top perforations and bent to fit the upper lip of the horse below the nostrils, substantially as described.

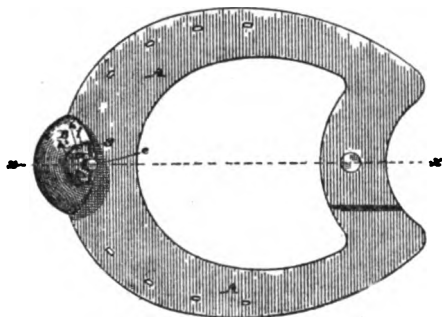
2. An inhaler for horses, consisting of the hollow medicine-receptacle having screw-capped ends and top perforations, and suitable straps to hold said receptacle in place under the nostrils of horse, substantially as herein described.

3. An inhaler for horses, consisting of the curved hollow medicine receptacle having the top perforations, the cross-strap connected with said receptacle, and the front strap connected with said receptacle and with the cross-strap, substantially as herein described.

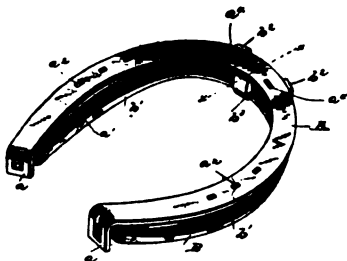
4. An inhaler for horses, consisting of the curved hollow receptacle provided with top perforations, the cross-strap and front strap fitted to said receptacle by sliding loops, whereby they can be removed, and the side straps for connecting the receptacle with the head-gear of the horse, substantially as herein described.

Claim.—In combination with the main body of a horseshoe, the clip *a*, having its lower side about midway of the vertical thickness of said main body and provided with the oblique hole *b*, the lower end of which is enlarged, the toe-weight *B*, having the recess *c* in its inner face to receive the clip *a* and provided with the hole *d*, the bolt *e*, provided with the head *c1*, adapted to fit the enlarged portion of the hole *b*, and the nut *f*, all constructed, arranged, and operating substantially as described.

451,647. ATTACHING TOE-WEIGHTS TO HORSESHOES. GEORGE W. WHEELER, Boston, Mass. Filed Sept. 20, 1890. Serial No. 365,642. (No model.)



451,882. HORSESHOE. GEORGE D. LYNN, Pittsfield, Ill., assignor of one-half to Willard G. James, same place. Filed Aug. 16, 1890. Serial No. 363,065. (No model.)



Claim.—1. In a horseshoe, the combination, with the shoe proper having apertured heel-calks, of a spring bowed or sprong beneath the quarters of the shoe and provided with end tenons fitting in the apertures of the calks, substantially as set forth.

2. In a horseshoe, the combination, with the shoe proper having apertured heel-calks, of a

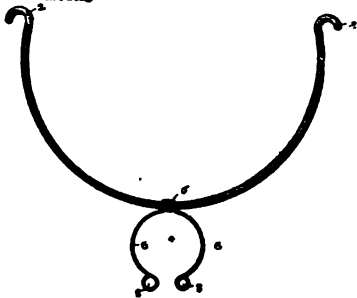
spring having its ends provided with tenons fitting in said apertures and also pro-

vided at its forward portion or toe upon opposite edges with upwardly-extending clamping-lugs, substantially as set forth.

3. In a horse-shoe, the combination, with the shoe proper having apertured heel-calks, and also having its toe re-enforced or enlarged upon its under face, of a spring having its ends provided with tanons fitting in said apertures and provided at its forward portion or toe and upon opposite edges with upwardly-extending lugs adapted to clamp the re-enforced or enlarged portion of the toe of the shoe, said toe and the corresponding part of the spring being also provided with registering holes for the reception of nails, substantially as set forth.

451,608. HORSE-TAIL HOLDER AND REIN-GUARD. JAMES W.

LINDSAT, Fresno, Cal. Filed Aug. 12, 1890. Serial No. 261,859. (No model.)



Claim.—1. The herein-described rein-guard, consisting of a guard or support adapted for connection to the harness and of a tail-holder formed of spring-wire bent to form a spring-coil 5 for loosely receiving the guard, and at each side of the coil with curved arms 6, substantially as specified.

2. The bow-shaped guard 1, terminating in hooks or eyes 2, adapted to pass through perforations formed in the hip-straps of a harness, and the tail-holder, the same consisting of the central spring-coil 5 for loosely receiving

the guard, and provided at each side of the coil with curved arms 6, diverged to form the tail-embracing portion and terminating in the eyes 2, substantially as specified.

EDITORIAL DEPARTMENT.

VETERINARY LEGISLATION, NEW YORK STATE.

It is an old aphorism, "in time of peace, prepare for war." The Veterinarians of New York State, have just been defeated at Albany, in an attempt at legislation for the benefit of themselves and the community. An act to establish a State Board of Veterinary Examiners, and to regulate the practice of Veterinary Medicine and Surgery throughout the State of New York (see appendix), was reported favorably from the General Laws' Committee, passed second reading, and was lost on final passage in the Assembly; it received 46 votes, out of about 100. A prominent Veterinarian tells us that, "its defeat was largely due to the fact, that prominent papers in the State opposed the measure; certain papers criticised the bill, in an ignorant way, showing, that they knew nothing of its purpose." This may be true, but if it is the only cause, it shows lack of organization and discipline on the part of the Veterinarians. We have always found that the prominent

newspapers, are willing to advance the interests of our profession, and if they show ignorance of the foundation of our cause, they should have been instructed and convinced of its merits. Professional men have not much familiarity with the cunning ways, and shrewd deeds of the politician. The political profession is one *per se*, which requires as long an elementary study, as any other, and for which, new matters must be presented in a very concise, clear form.

Now is the time for action, let us at once study the merits of the act, which has just been defeated. In the JOURNAL, during the last year, will be found copies of the Bills, which have been presented and passed in Pennsylvania, New Jersey, and California. Let us study those; let every Veterinarian in New York State, see his Representative at once, go over the act with him, and inquire wherein it was defective, or why there was any serious objection to it. Find out if the Representative will object to the Bill if re-elected, or if he will support it, and find out what changes will be advantageous to it; do not delay in this matter for a month, or until next week, but see the MEMBER at once, and immediately, having seen him, report the result of it, to the Secretary of the New York State Veterinary Medical Society. When the next election takes place, let every Veterinarian see the candidates, interview them, and support the one, who will promise to support proper legislation for the Veterinary profession. If everyone will do his duty at once, and make a report, these can be properly digested before the next meeting of the New York State Veterinary Medical Society, and reported in such form, that a more suitable Bill, if such is required, can be prepared, and be already worked up before the meeting of the legislature. We assure the Veterinarians of New York State, that our pages will be freely open at all times for the advancement of this matter, and we trust, that they will use them for an expression of their opinions. Remember that it is important to see other Veterinarians, who are not members of the New York State Society, to learn their views, and if they are in opposition to persuade them into friendship.

AN ACT

To establish a State Board of Veterinary Examiners and to regulate the practice of Veterinary Medicine and Surgery throughout the State of New York.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. Within sixty days after the passage of this act, the Governor of the State shall appoint seven Veterinarians each of whom shall hold a certificate of graduation from an incorporated Veterinary College or University, to be selected from a number not exceeding fourteen (14) as follows: Seven nominated by the New York State Veterinary Medical Society, and seven by the Long Island Veterinary Medical Society, and their successors shall be appointed in like manner.

SECTION 2. Each member shall take and file the constitutional oath of office required of public officers.

SECTION 3. The said members of said Board shall meet on the second Tuesday of July, in the year 1891, in the city of Syracuse for organization. The hour and place of meeting to be designated by the Secretary of the State Society, at which time they shall elect a president, secretary and treasurer, and may adopt such rules and regulations not inconsistent with law as they may deem necessary.

SECTION 4. Each member of said Board shall hold office during good behavior and may be removed by the Governor for mis-conduct or incompetency upon reasonable notice of charges made against him and an opportunity to be heard. But no member shall hold office after he is 65 years of age, and the term of office of any member shall expire upon his reaching that age.

SECTION 5. It shall be the duty of said Board to examine any person over 21 years of age and a resident of this State applying for licenses under this act, provided that said applicant shall first show to the satisfaction of said Board that he has practiced Veterinary Medicine and Surgery for a period of not less than ten years, or that said applicant holds a diploma or certificate of practice from an incorporated Veterinary College or University, or from the Agricultural Department of Cornell University, after at least two years of continuous study thereat, and shall have duly paid to the treasurer of said Board all fees hereinafter prescribed.

SECTION 6. Said Board shall keep a record of all persons licensed by them to practice Veterinary Medicine and Surgery, and shall file with the Secretary of State and with the Secretary of the New York State Veterinary Medical Society, on or before the first day of July of each year a detailed report of the proceedings of said Board together with a statement of all their receipts and disbursements.

The members of said Board shall hold at least one meeting each year for the examination of applicants and as many other meetings as they may deem requisite. The first meeting of the said Board shall be held on the first Tuesday of May in the city of Syracuse, of which proper and timely notice shall be given through the Veterinary Journals of the State.

ARTICLE 5. Five members of said Board shall constitute a quorum, and the concurring vote of a majority of the members present at a meeting at which there is a quorum shall be deemed the decision of the Board.

ARTICLE 6. Every applicant for a license shall upon making his application pay to the Board of Examiners the sum of twenty dollars, and on receiving his certificate the further sum of five dollars. In case of failure at any such examination the applicant after the expiration of six months and within one year shall have the privilege of a second examination by the Board or by a committee of one or more of the Board without the payment of an additional application fee.

ARTICLE 7. From the income provided by this Act the expenses of the examiners shall be paid. Any surplus after all proper expenses incurred by the Board shall have been met, if any surplus shall remain, shall be apportioned among said examiners pro-rata, as compensation for their services.

After July 1st. 1891, every person now practicing Veterinary Medicine and Surgery in this State by virtue of Chapter 313 of the Laws of 1886, who does not hold a certificate of graduation from some incorporated Veterinary College or University or the Agricultural Department of Cornell University shall assume the title of "Farrier" until he shall obtain a certificate of graduation from an incorporated Veterinary College or the Agricultural Department of Cornell University, or a license to practice from the State Board of Examiners. And it shall be the duty of the County Clerk to write opposite the title the record of the Veterinarians, Veterinary Surgeon, or any other like title of the name of every practitioner who has registered under the provisions of Chapter 313 of the Laws of 1886, and who does not before July 1st. 1891, produce a diploma as evidence of his graduation from some incorporated Veterinary College or University the words the title annulled and the title "Farrier" substituted under the provisions of Chapter of the Laws of 1891, inserting the Chapter under this Act.

After July 1st. 18891, it shall be unlawful for any person to practice Veterinary Medicine and Surgery or any branch thereof in this State who are not now legally authorized to practice and those who shall not obtain the certificate of qualification after due examination from said Board of Examiners.

Nothing in this Act shall be construed to prohibit students from prescribing under the supervision of duly authorized preceptors or to prohibit gratuitous services in cases of emergency or to prohibit any legally qualified practitioner, residing in another State, meeting Surgeons of this State in consultation or residing on the border of a neighboring State and duly authorized under the law thereof to practice Veterinary Medicine and Surgery therein whose practice extends into the limits of this State providing that such practitioner shall not open an office, or appoint a place to meet and treat patients, or receive calls within the limits of the State of New York.

SECTION 7. Every violation of this Act shall be deemed a misdemeanor.

SECTION 8. This Act shall take effect immediately.

This bill was introduced in the Legislature Feb. 26th, by Mr. Peck, of Cortland County.

SECOND CONGRESS FOR THE STUDY OF TUBERCULOSIS.

The Second Congress for the study of tuberculosis, will meet in Paris, from the 27th of July to the 2nd of August, 1891, under the Presidency of Professor Villemin. The following questions will be discussed :—

1. The identity of tuberculosis in man and tuberculosis in the bovine, gallinaceous, and other animals.
2. The bacterien and morbid associations of tuberculosis.
3. The quarantine (Hospitalisation) of tuberculosis.
4. Prophylaxy of human and animal tuberculosis.
5. Agents capable of destroying the bacillus of Koch, not harmful to the organism, from the point of view of prophylaxy and therapeutics of human and animal tuberculosis.

Subscriptions to the Congress, 20 francs, should be sent to M. G. Masson, Treasurer, 120 Boulevard St., Germain.

Communications should be sent to Dr. L. H. Petit, General Secretary, 11 Rue Monge.

INDIAN VETERINARY JOURNAL.

Our regret, at the termination of the *Quarterly Journal of Veterinary Science* in India, with the last number of vol. 8, October 1890, was sincere, as we have looked with interest on the fruitful endeavors, of the talented Veterinarians of the Army in India, in their deversified work with elephants, camels, horses and cattle, among a people, which has furnished apt students, but which was difficult to reach on account of the entire difference of language. The labor incumbent upon the English Veterinarian in India, has been evident in the *etymology* of their materia medica; to reach even the English speaking natives, they have been obliged to use native words, both for diseases and for drugs used as remedies. From the pen of John H. Steel, the editor of the Journal, we received some of the most valuable additions to veterinary literature that have been published in recent years.

A new Journal has appeared, the *Indian Veterinary Journal*. A new Quarterly Journal devoted to veterinary matters, published in Urdu, edited by Henry I. Pease, M. R. C. V. S., London.

Army Veterinary Department, Veterinary Surgeon to the Punjab Government, and Professor of Pathology, Lahore Veterinary School.

The first number has reached us in hieroglyphics, and from our point of view, only valuable as indicating the advance of the profession in that country, for the volume of 70 pages is printed in Hindostanee, it has the appearance of each page being a wood cut. The title, with a picture of a Centaur, is evidently on the last page, and the writing goes backwards.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEONARD PEARSON, B. S., V. M. D.

SODIUM CHLORIDE AS A THERAPEUTIC AGENT.

Vet. Imminger—Donauwoerth.

I. recommends tracheal injections of 50 c.cm. of a 5 per cent. Na Cl solution twice daily, in the horse and cow, to combat weak heart, connected with anæmia, or the result of hemorrhage. A beneficial action can, of course, only be expected when the red blood corpuscles are not too much diminished in number. If disease of the respiratory tract does not permit of a tracheal injection, the Na Cl solution is introduced per rectum. The rectum is first freed from *fæces* by injecting 10–20 gr. of glycerine, and then 4 to 6 liters of a 3 to 5 per cent Na Cl solution are injected; this is applied twice daily, and continued until an improvement in the condition of the animal sets in.

In cases of luxation of the patella 5 to 10 c.cm., or even more, of a 15 to 20 per cent. solution of Na Cl are injected above the region of the patella. The injection generally causes considerable pain and extensive swelling of the surrounding tissues. As the result of the swelling the animal moves the limb, to a very little extent, and to this circumstance Donauwoerth ascribes much of the beneficial action of the salt injection.

For the treatment of bursal enlargements of the ankle joint 15 to 30 c.cm. are to be injected on each side of the joint; the

needle should not be plunged too deeply into the tissues, but directed between the connective tissue and the skin. To prevent the formation of an abscess, care should be taken that the skin and hair, as well as the needle and syringe be thoroughly disinfected; for the disinfection of the skin use a one per cent. sublimate soap.

In inguinal hernia he achieved good results by injecting 5 c.cm. of Na Cl solution near the anterior border of the rupture and the same quantity near the posterior border; care should be taken that the intestine does not become united to the wall of the abdomen during the inflammatory process. *Wochenschrift für Thierheilkunde*, No, 6, 7, 8.

FLUID EXTRACT OF HYDRASTIS CANADENSIS AS A REMEDY
FOR PURPURA HAEMORRHAGICA.

Dr. Lemke, Berlin.

In 1888, Prof. Hutyra, of Budapest, experimented with Ext. Hydrst. canad., fl., in cases of purpura hæmorrhagica and claimed good results from its use. The drug causes contraction of the blood vessels, thus preventing transudation and hemorrhages.

Dr. Lemke has used it in three cases in which he administered, subcutaneously, a daily dose of 5 grains dissolved in 10 grains of water. In two of these cases improvement commenced at once; the swellings on the legs, breast and head grew rapidly smaller, and the hemorrhagic spots in the nose decreased in size and intensity of color. Both horses made full recoveries. The condition of the third horse improved for three days; then diarrhoea set in and, in spite of all treatment, increased in severity at such a rapid rate that the horse died. Dr. Lemke is encouraged, by his limited experience, to think that the drug in question has a beneficial effect on this disease and recommend further trials.

It is necessary, in order to avoid inflammation at the point of injection, to have the syringe well sterilized and to use the purest materials in making the solution. *Zeitschrift für Veterinarkunde*, for May, 1891.

ECHINOCOCCUS LARVAE IN THE THORAX OF A HORSE.

Lienaux (Anales méd. vét. de Brux. Août. 1890.) found a multitude of echinococcus larvæ in the thorax of a horse. These parasites were situated principally on the pleura; the lower part of the right side being entirely covered with cysts varying in size

from that of a pea to that of a child's head. They were also found on the left side, on the diaphragm and mediastinum. There were, in some places, adhesions between the pulmonary and costal pleuræ. There were a few cysts in the substance of the lung. Some cysts were also found in the subcutis and a fluctuating swelling between the twelfth and sixteenth ribs was discovered to be an echinococcus cyst that was in direct communication with the cysts within the thorax. All of these parasites belonged to the echinococcus polymorphus. The horse had not been observed to have any respiratory difficulty until near the end of his life. *Zeitschrift für Veterinarkunde* for May, 1891.

ANTISEPTIC BANDAGE.

As an antiseptic bandage for parts of the body that can not be readily covered by the ordinary roller or cloth bandages the *Pharmæ Ztg. No. 26* recommends the following mixture: Zinc oxide., Aqua dest., of each fifty grms; Zinc chlorat., five or six grams. This makes an elastic paste which adheres firmly to the skin, is light and forms a highly satisfactory germ-proof bandage. It is best not to mix the paste until the moment that it is to be used. *Zeit. f. Veterinarkunde, II. 2.*

CAMPHOR.

Camphor has the effect of making iodoform more soluble. For example: ten grams of saturated alcoholic solution of camphor will dissolve one gram of iodoform, while the same amount of pure alcohol will dissolve but 0.12 grams of iodoform. *Deut. Med. Ztg. No. 22.*

QUITTOR.

In seven cases of quittor in which the lateral cartilage was excised, in the clinic of the Dresden Vet. School, the horses were able to do hard work, on an average, thirty-one days after the operation was performed. *Wochenschrift für Thierheilkunde, No. 50.*

BOG SPAVIN.

Veterinarian Zimmer, of Münchenberg, treated two cases of bog spavin for a long time with iodine, blisters, bandages, massage, etc., without result. As a last resort he punctured the

joints with a hypodermic needle, drew off the synovia, and injected a one-thousandth solution of corrosive sublimate, which was at once pressed out again and followed by a sharp blister of the entire hock region. The result was a perfect cure in each case. Much stress is to be laid upon the antiseptic manner in which he performed his operations. *Wochenschrift für Thierheilkunde*, No. 44.

ACTION OF KOCH'S LYMPH IN BOVINE TUBERCULOSIS.

The first application of Koch's lymph in veterinary medicine has been made at the Veterinary Institution at Dorpat, by Professor Gutman.

The lymph was injected into the costal region, behind the shoulder, of three cows, in which tuberculosis was diagnosed from physical examination of the chest, and presence of bacilli in the milk and in the discharges. The day before the operation the rectal temperature was taken every two hours from 8 A. M., until 6 P. M., and on the next day every hour, night and day.

Cow No. 1. Nine years old, weighs 374, kilograms has coughed for a month, bacilli in bronchial secretion and in the milk; no apparent lesions in the mammæ. She received on December 25, 1890, at 9 A. M., an injection of one decigram of lymph, and the evening of Dec. 28 a second injection of three decigrams of lymph.

Cow No. 2. Five years old, weighs 376 kilograms, has coughed three months, has the lymphatics of the throat and of the inguinal region enlarged; nothing abnormal on percussion of the chest, on auscultation exaggerated vesicular murmur, bacilli not found, she received on Dec. 25, at 9 A. M. an injection of two decigrams of lymph.

Cow No. 3. Fifteen years old, emaciated, weighs 262 kilograms, pleuretic friction on the left side, strong vesicular murmur both sides; tubercular bacilli in the bronchial secretions. This animal received on Dec. 25, at 9 A. M. an injection of three decigrams of lymph.

Koch's lymph causes in tuberculous cattle a sensible elevation of temperature. This elevation occurred in the three animals about *eleven hours* after the inoculation. The intensity and duration of the reaction was in direct ratio to the

quantity of lymph injected. In the first case the temperature reached 40° c. (104° F.); in the second, 40.8° c. (105.1° F.); in the third, 41.3° c. (106.3° F.). The duration of the fever was four hours in the first, nine hours in the second, and ten hours in the third. In the first cow, which received a second injection on the nights of Dec. 28-29, although the quantity was tripled, the reaction showed in eleven hours, and was less intense than that which followed the first. In two healthy (as shown by autopsy afterwards) bulls, injection of lymph, made at the same time as that on the diseased cows, caused no sensible elevation of temperature. As shown by these experiments that Koch's lymph causes fever in tuberculous cattle and does not in healthy cattle, it may be considered an efficacious means of diagnosis in tuberculosis of the bovine race, especially in difficult cases.

The Imperial Sanitary Bureau of Germany, published the results of experiments made with Koch's lymph in bovine tuberculosis. These experiments were made by Roeckl and Schütz, under the supervision of Dr. Koch, on, first; two cows diagnosed as tuberculous by Professor Eggeling; second, a healthy heifer, as control subject. The injections consisted of a half cubic centimetre of lymph in 4 1-2 cubic centimetres of a half per cent. watery solution of phenic acid. In the first tuberculous cow the injection was made at 8 A. M. January 24, her temperature was then 38.8° c. at 9 P. M. it reached 40° c. at 3 A. M. 40.3° c. at 8 A. M.; and lowered to 39° c. at noon. The animal was then slaughtered and showed lungs and thoracic ganglia containing a mass of tubercular matter and numerous bacilli.

The second cow, with a temperature of 38.1° c. was injected at 9 A. M. At 8 P. M., the temperature reached 42.2° c.; at 1 A. M. 40.9° c. at 7 A. M., 40.1° c. and at 3 P. M., it had returned to 38.9° c. On slaughter, the cow was found tuberculous in the lungs, and lymphatic ganglia of the chest, liver and spleen. There were numerous bacilli in the caseous matter, contained in the pulmonary cavities. Several hours after the injections there was redness, tumefaction and sensibility around the point of puncture. The third animal, healthy heifer, with a temperature of 38.8° c. showed no reaction after injection. The autopsy showed her to be perfectly sound.

Dr. Sticker, Veterinarian at Cologne, injected four tuberculous cows with 1 c. c. of lymph and obtained reaction in from seven to nine hours. The autopsy on one, made three days later, showed recent irritation of the lungs. Two other cows with

chronic affections, not tubercular, received the same injection and showed no reaction.

At the Veterinary School at Toulouse, Drs. Labat and Conte, obtained similar results. An injection of two decigrams in a tuberculous cow raised the temperature from 38.4° c. to 39.8° c. in nine hours; thirty-six hours later an injection of four decigrams raised from normal to 40° c. in twelve hours. The inoculated points showed local inflammatory reaction. The autopsy confirmed the diagnosis. The conclusion is the same as in the other experiments; that Koch's provokes an important febrile reaction in tuberculous animals.

Professor Degive* draws the following conclusions: "Supposing that Koch's lymph may be an efficacious curative remedy in a majority of cases, it would not be an economical method to use with our domestic animals. The cures would never be sufficiently radical, nor sure, to give the guarantee demanded by public hygiene. No one could assume that the animal apparently cured, had not latent spots and stupefied tuberculous germs, waiting only for an accidental cause to bring them to life, and a new proliferation with all the dangers of the disease. It is wiser to treat tuberculous animals as now required by the laws of Sanitary Police."

"But if Koch's lymph appears to have little value as a veterinary therapeutic agent, it still seems to be of importance as a reactive, as a means of diagnosis of tuberculosis."

Further experiments should be made to determine, first; in what doses Koch's lymph should be used to obtain a general reaction, of desirable degree; second, if the general augmentation of temperature is a constant effect of the inoculation; third, if this reaction will occur in other chronic affections, which may be confounded with tuberculosis.

A commission at the Alfort Veterinary School, has undertaken a series of experiments, as has Professor Degive, which may determine these points.

Revue Vétérinaire April, 1891.

* Annales de médecine vétérinaire, 1891, p. 85.

SHEEP DIPS.

For the second time, our inspectors of scab areas have sent in annual reports upon the different sheep dips used in their several districts.

From these reports—twenty-five in all—we gather the following most useful information in regard both to the relative efficacy of the dips according to the experience of sheep-owners, and the extent to which such dips are respectively used—and it is in the latter degree that they are tabulated as follows :—

1. **LIME AND SULPHUR.** No less than twenty-four areas concur in the opinion that this preparation ranks first in the generality of its use and as a killer of scab. Its cost, however, is slightly greater than that of some of the other dips. The ingredients and mode of preparation of this dip are as follows, viz :—Lime (slaked) and sulphur, 18 lbs. of each (minimum strength), to 100 gallons of water. The lime is at first slowly slaked in the usual way, then the rest of the water and the sulphur added. This mixture, when boiled for about twenty minutes, is to be well strained, and when used for dipping brought to a temperature of about 100° Fahrenheit.

2. **COOPER'S DIP,** comes next in order of merit and in extent of use, and in most districts is considered second only to "lime and sulphur," twenty-one areas reporting very favorably as to its efficacy.

3. **TOBACCO,** eighteen areas report favorably of the effectiveness and extensive use of tobacco dip, the mode of preparing which is as follows, viz :—Tobacco extract, 25 lbs. (minimum strength) of good, sound, fermented tobacco to 100 gallons of water. The mixture should be prepared by steeping the tobacco in cold water for not less than 24 hours, then, when about to use it, raise the water to the boiling point, immediately withdraw the fire and allow it to draw like tea for an hour, when it is fit for use. N. B.—The solution should be thoroughly strained by pressure from the leaves.

4. **LITTLE'S DIP.**—The majority of reports concur in the statement that this dip, although not so much used as the dips before-mentioned, is effective.

5. **MCDUGALL'S DIP.**—And precisely the same thing is said in regard to this dip.

6. QUIBELL'S DIP.—From four areas reports favorable have been sent in, but in other areas it appears to be so little used as to be practically almost unknown.

7 and 8. GLYCERINE AND HELLIER'S DIP.—The same can be said concerning these dips, three areas reporting favorably about each, whilst in the remaining areas the dips are practically unknown.

9. HAYWARD'S DIP.—Newly introduced. The two reports received are favorable, both adding that the dip is "very similar to Cooper's."

10. TAR ELIXIR.—Practically unknown in our scab areas.—*Agricultural Journal*, Cape Colony, Vol. III, No. 18.

CLIPPING OF HORSES.

At a recent meeting of the *Société Centrale de Médecine Vétérinaire* the above subject was introduced by M. Lavalard, and an interesting discussion took place.

M. Lavalard said that the horses of the Omnibus Co., in Paris had not been clipped during the winter and the results were satisfactory. They escaped many of the ailments of previous winters, after which the clipped horses regained their flesh and new growth of hair with difficulty.

M. Leblanc said that his experience was that unclipped horses returned to the stables after work covered with sweat which did not dry during the night. This resulted in loss of appetite and strength both of which returned as soon as the animals were clipped.

M. Weber thought the accumulation of hair increased the number of respirations.

M. Laquerriere said that in his experience with cavalry horses in Algeria he found those which were clipped were always in better condition than the others. They should be clipped in October so that the hair would be slightly reproduced before the advent of extreme cold. He had once made an experiment to test the question. 100 horses, 20 from each squadron were clipped, 100 others were not clipped, all were in the same conditions as regards age, race etc. The 200 were weighed beforehand, and again at close of the winter. The clipped animals were found to weigh more than the others.

M. Aureggio was opposed to clipping. He said that the Government ordered all the horses in the army to be clipped in 1872, because they were in such a miserable condition after the war, and that the decree of 1883 prescribed clipping as an exceptional measure. Like the most of my confrères in the army I have never ordered the horses clipped except as a therapeutic measure, and have never noticed an increase of the diseases of the chest or abdomen in consequence.

M. Laquerriere said that the care of the skin was much easier in clipped animals and that they showed more vigor and energy after the operation. Besides they are not so liable to be chafed by the harness or if chafed more easily healed, grooming is easier and more quickly done, whilst the function of the skin is maintained and cutaneous eruptions are prevented.

After the fatal Franco-German war the unfortunate horses which had taken part were found to be suffering from cutaneous eruptions. They were nearly all clipped but more to facilitate treatment rather than as a hygienic measure. In the years following clipping became general and the curry-comb suppressed. In many animals the operation was delayed until January and those suffered terribly. Those which had been clipped before the cold began were in good condition. I have made a series of careful experiments among the army horses and have come to the following conclusions :—

Clipping when performed at the proper time is an excellent hygienic operation for the horse. It increases its vigor and energy, diminishes cutaneous transpiration, favors the prompt drying of the skin when it is impregnated with sweat, in other words; it regulates the function of the skin, prevents the effects of cutaneous chill on the viscera, facilitates good grooming, and prevents chafing by the harness or facilitates treatment when chafing takes place.

M. Aureggio said that although clipping improved the appearance of the horse and made grooming easy it had serious disadvantages when not done under cover, in warm stables and with double rations of hay.

M. Decroix thought that the adoption of this operation as a general measure in the army would be unfortunate because all the regiments of cavalry are not under the same conditions of climate, etc.

M. Mattieu, a veterinarian of great experience, was of the opinion that if a horse be well nourished with good oats his hair will be

short and brilliant and will never need be clipped, but if clipped under good hygienic conditions will profit by the operation. On the other hand if the supply of oats be small his skin will be dirty with long and dull hair and will not profit by clipping.

M. Aureggio said that clipped horses required an increased ration of oats, often an impossibility in the army, and for that reason an argument against clipping.

M. Menard said that circumstances should guide the hygienist or the economist in accepting or rejecting the operation. In the *Jardin d'acclimatation* some animals were never clipped while others were four or five times a year. These latter, Island Ponies, coming from a cold climate with thick and warm fur, like all animals from the North, would be absolutely unfit for service if never clipped even in mid-winter.

I believe, therefore, that each one should be guided by the requirements of each case and this is the only conclusion which can be drawn from the discussion.—*Recueil de Médecine Vétérinaire.*

TUBERCULOSIS IN MONKEY.

Rupture of Uterus.

About the first of April a female rhesus monkey (*Macacus rhesus*) was noticed to have a cough. Simple remedies were given it, and on the tenth she gave birth to a foetus about five months old, which was sent to Prof. B. G. Wilder, of Ithaca. After that time the monkey continued to droop, and died on the 2nd of May. A post mortem by Dr. Geo. S. Huntington revealed the following: Right lung, excessive tuberculosis, involving large portions of all lobes; bronchial (right) and posterior mediastinal glands tubercular; tubercular abscess in bronchial gland opening into bronchus just beyond bifurcation of trachea; left lung and other thoracic contents healthy; abdominal viscera healthy; uterus somewhat enlarged and in an advanced condition of involution; tissue exceedingly friable. There is a rupture on posterior aspect of fundus transverse, and a second tear in anterior uterine wall at about the middle. The edges of these ruptures were covered with a small amount of coagulated blood. No blood or fluid in peritoneal cavity. No peritonitis. If these tears in the uterus occurred ante mortem they must have taken place immediately before death in order to account for the absence of blood in peritoneal cavity, and the absence of inflammatory effusion. It is possible that this occurred in some way, post mortem, in handling the body before opening it, in the exceedingly friable condition of uterus. The condition of right lung would be a sufficient cause of death. It is possible that the uterine rupture occurred during life and produced death by shock in an enfeebled animal.*

* Such cases occur in bitches. *Ed.*

SOCIETY PROCEEDINGS.

Keystone Veterinary Medical Association.—The regular meeting of the Keystone Veterinary Medical Association was held at the College of Physicians, Philadelphia, May 2, 1891.

The President, Dr. W. H. Hoskins, in the chair. The following answered roll call :—Drs. Werntz, Webster, Hoskins, Sellers, Goentner, Weber, Kooker, Lintz and Drake.

The minutes of the previous meeting were read and adopted. Dr. Hoskins, Chairman of the Legislative Committee, said the work was being carried on without much success. Dr. Schreiber failed to appear to read his paper on the subject of Milk Inspection of Philadelphia. Dr. Sellers, said milk and meat inspection should be more rigid in New Jersey as well as in Philadelphia, as he has seen cattle in Camden that came over to Philadelphia to be slaughtered, and the meat used in the manufacture of bolona sausage, that were effected with Tuberculosis and not fit for food.

Dr. Werntz said quantities of diseased meat are brought in from surrounding dairy farms and sold in the markets, we should have a law against it, and the law should be enforced. He was one to introduce a bill before the legislature, in which a veal must be twenty day old, and weighing no less than sixty lbs., before being placed upon the market for food. He says he has seen cattle too sick to walk, brought in after dark, slaughtered and put on our markets.

Dr. Weber says he can drink milk in Philadelphia with perfect safety, due to the present milk inspection of the city. He stated that the officials are examining different samples of milk, under the microscope at the Public Buildings for the Koch Bacillus. Dr. Goentner, said Dr. Weber refused to drink milk at Lancaster when he was there as his guest. Dr. Weber replied, that he did not drink it yet when at home in Lancaster. Dr. Goentner asked, has the Tuberculous Bacillus been found in milk? Dr. Hoskins answered yes! it has been found in milk without any lesion of the glands being detected.

Dr. Kooker thinks milk inspection as it is now being carried on matters little to the Veterinarian, trying to find the Bacillus in milk is not a preventative but simply a scientific investigation. That the Keystone Veterinary Medical Association and State should do more to forward the matter, and that we should have a set of resolutions up before the next legislature, in which the inspection should take place at the farms; he thinks every practitioner should have his local district and be paid for the same, the inspections to take place at certain periods of time. To get these resolutions passed we should go in a body, Physicians, Board of Health and Veterinarians.

He wants resolutions passed to express to the public the views of the Keystone Veterinary Medical Association.

He, as President of the State Association has appointed Dr. Hoskins to read a paper at the next meeting on the subject of Milk and Meat Inspection.

Dr. Sellers thinks water the least harmful of any of the adulterations of milk, Dr. Doremus in his lectures, says, test milk for the sugar, for the sugar

seldom varies, the solids vary and the water can be detected. Dr. Weber thinks there should be better Hygienic inspection.

Dr. Hoskins thinks the inspection is clearly from a commercial standpoint, coloring matter was used, also acid to keep it sweet. The present inspection is good but deficient in regard to milk, the work should be carried further, put the resolutions in the medical journals, newspapers, etc.

Dr. Kooker suggests that the president appoint a committee to draw up a set of such resolutions, giving views of this association. Moved and seconded, carried. The president appointed Dr. Huidekoper chairman, Drs. Werntz, Weber, Goentner and Kooker.

Dr. Hoskins cited a case of a green western horse suffering with Influenza, having his tail tied up very tight, the tail swelled to an enormous size which was followed by twenty-three distinct abscesses and a large slough at the end, with a complete relaxation of the sphincter ani, semi membranosis and semi tendinosis muscles, great lameness followed, hardly able to stand, weak pulse, high temperature, is now convalescing, now has a new growth of hair covering the tail.

The vice-president's position being empty, by the resignation of Dr. Ridge, Dr. Werntz was nominated; it was moved and seconded he be elected by acclamation, the chair to cast the vote. Carried

The meeting then adjourned.

M. W. DRAKE, *Secretary.*

Massachusetts Veterinary Association.—The annual meeting of the Massachusetts Veterinary Association, was held at Young's Hotel, Boston, Wednesday evening, April 22, 1891.

President Thomas Blackwood, in the chair. Minutes of last meeting read and accepted. Annual reports of the secretary and treasurer read and accepted. The secretary was instructed to continue and subscribe for the *VETERINARY JOURNAL*. Motion made by Dr. Saunders, and seconded by Dr. Hitchings, that the chair appoint a nominating committee to report a list of officers for the ensuing year. Carried.

The following nominating committee was then appointed :—Drs. Winchester, Saunders and Hitchings. It reported the following names :—For President, L. H. Howard, D. V. S.; for Vice-President, W. H. Hitchings, D. V. S.; for second Vice-President, W. A. Sherman, D. V. S., M. D.; for Secretary and Treasurer, Austin Peters, M. R. C. V. S.; for Executive Committee, A. Marshall, M. R. C. V. S.; C. E. Hadcock, M. D. V.; E. C. Beckett, M. D. V.; Charles Winslow, D. V. S.; and George Penniman, D. V. S.

Moved by Dr. Winchester and seconded by Dr. Saunders, that the secretary cast one ballot for the list of names appointed by the Nominating Committee. Carried. The secretary then cast one ballot in the affirmative, and the above list of officers were declared duly elected. The new President, Dr. L. H. Howard, then took the chair. Moved by Dr. Hitchings, seconded by Dr. Saunders, that the retiring officers be given a vote of thanks for their services during the past year. Carried unanimously. The meeting then adjourned to the annual dinner.

AUSTIN PETERS, *Secretary.*

COMMUNICATIONS.

OSTEO POROSIS.

Editor of The Journal of Comparative Medicine, Etc. :

SIR,

I notice with pleasure, in THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES, a very able article on Osteo Porosis, by Dr. T. H. Berns, V. S. For some time past, it had been my intention to use the medium of your valuable Journal to, if I may so call it, open a discussion, or rather, to ask the coroboration of my professional brothers, in a trial to throw some light upon that important subject. According to Dr. Berns's history of the disease, osteo-porosis *seems to be a disease of comparatively new origin*; this, in my mind, together with some facts I gathered, would but confirm my opinion that the disease is of infectious origin; and, if I may be allowed another supposition, that this infection may be due to, or at least is much favored by, malarial influence. Indeed, Dr. Berns and my experience is that the disease is mostly found (if not entirely) *under certain soils and certain conditions*. In my practice in the South, I have met with a great many cases, (it is very common here) and may safely state, that in nine out of ten cases, the patient was kept in badly located, and dirt floor stables.

I do not think I can now throw any light upon the subject, all we can arrive at, is: Conclusions from our own practical knowledge; I do not doubt that, if the members of the veterinary profession would give their experience of the disease through your valuable Journal, we may arrive at some conclusions, that would furnish us with a *starting* point, founded on facts, from which at the same time, much valuable informations could be obtained.

There is one thing however in Dr. Berns' letter, that I cannot pass upon without comment, that is: *It would be folly, to attempt treatment of the disease*. From his own conclusions, I think the first step in the treatment of osteo-porosis, is removal to a healthy stable, a good pasture if possible. Then, the influence having ceased, why would we not try an alterative and tonic treatment, assisted by the best kind of food, and early stimulation to affected parts? We would, by so doing, help the system, in ridding itself of that matter, whatever it may be, which finds its way into the body of animals.

I do not wish to be understood as criticising Dr. Berns' valuable paper, but I am simply advocating a mode of treatment which I am now experimenting upon and which has given good success in other hands than mine, as the following explanation will show: one case was under my care for some time (about six month's ago), and after a few weeks, the unmistakable symptoms of osteo-porosis *being more developed*, I told the owner that I could do no more for the patient; (enlarged maxillaries, lame in *every* leg, and not worth \$5.00 at auction). The mare I have reference to happened to be a *pet mare*, and as the owner could not decide to destroy her, I advised him to see an acquaintance of mine, who, some time before, had told me of many cures he had made of *big head*. It was done, and the mare was treated by him. For the past three month's, the mare has resumed her work (saddle), and seems as good as ever; the *the swelling of the head* has not disappeared, and is still there to show the visit of the dreadful disease. I have one case on hand, that seems to be doing well, but I am not prepared to report, as I would not take such a responsibility, without proving that the treatment has been successful in my own hands. The gentleman I have reference to, is well-known here, and has the reputation of having cured many cases of big head.

Very respectfully, yours,

Savannah, Ga.

A. JASME, V. S.

NECROLOGY.

JOSEPH LEIDY.

Joseph Leidy, M.D., L.L.D., died on April 30, of an affection of the kidneys, followed by congestion of the brain. Dr. Leidy was born in Philadelphia, September 9, 1823. His ancestors on both sides, were Germans from the Valley of the Rhine. At the age of sixteen, he left school intending to become an artist. Employed in a drug store, for the next few years, he became interested in botany and minerals and commenced the study of medicine in 1840. His graduating thesis was on the Comparative Anatomy of the Eye of Vertebrated Animals. Immediately upon graduation he was appointed an assistant in the laboratories of the Medical Department of the University of Pennsylvania and, shortly afterwards, dropping the practice of medicine, he devoted himself

entirely to study and teaching until his death. From his universal discoveries and knowledge of Natural History, his work in Paleontology is especially interesting to the veterinarian.

In September, 1847, he published in the proceedings of the Academy of Natural Sciences his first Paleontological paper, entitled "On the Fossil Horse of America." The existence of remains of extinct horses on the American continent had been regarded with incredulity in consequence of the entire disappearance of these animals in after ages. The paper consists of descriptions and figures of specimens contained in the museum of the Academy of Natural Sciences, of Philadelphia, some of which the author regarded as belonging to the South American form described by Owen and others as indicating a new species, for which he proposed the name *Equus Americanus*.

Long before the active exploration of the West had added so immensely to the knowledge of the extinct fauna of that region, he had determined the former existence in a tropical climate on the western slope, of the lion, tiger, camel, the horse, rhinoceros, and many other forms having no immediate existing representatives. In 1853 the Smithsonian Institution published his memoranda on the extinct species of the American ox, and in the following year the elaborate *Ancient Fauna of Nebraska*.

"The Extinct Mammalian Fauna of Dakota and Nebraska," appeared as the seventh volume of the journal of the Academy. The work, a quarto of 472 pages, illustrated by 30 lithographic plates, was the result of the gradual accumulation of material during twenty-three years. This elaborate work was followed in 1873 by one of equal importance, under the title, "Contributions to the Extinct Vertebrate Fauna of the Western Territories." It forms the first volume of the superb quarto reports of the survey of the Territories under Dr. Hayden, and consists of 354 pages and 37 plates. For many years after the publication of his paper on "Fossil Horses," in 1847, Dr. Leidy was almost the only American author whose attention was given to the study of the extinct vertebrata.

His memoir entitled "Fresh Water Rhizopods of North America," is considered one of the best illustrations of Dr. Leidy's qualities as a naturalist, and a most enduring monument to his industry.

At the organization of the Veterinary Department of the University of Pennsylvania, Dr. Leidy, having a great interest in its plans, became a member of the Faculty, as Professor of

Zoology, and hoped, with the Dean at that time, for a museum to combine the collection of Comparative Anatomy and those of Veterinary School. As a teacher he was admired and loved by all students; as a man he was honored by all who knew him; as a scientist he was an example of methodical work, minute in details but ever ready to lend aid to those around him, and he was more than human in his integrity, honesty, and freedom from the petty jealousies of the pseudo-political world which darkens public institutions and aggregations of selfish men.

An autopsy was held in accordance with the rule of the American Neurological Society, of which the deceased was President and which society designs to examine for comparative purposes the brains of prominent men. By his own instructions his body was then cremated.

R. S. H,

LEON LAFOSSE.

Former Professor and Director of the Veterinary School at Toulouse, France.

Prof. Lafosse died on March 18, 1891; he was born in the department of Aisne, France, in 1816. A celebrated practitioner, teacher and writer in veterinary medicine for over a half century, Prof. Lafosse's name will stand high in the history of veterinary medicine, not only in his own country, but throughout the whole world. He is the author of 112 publications, on subjects of Surgery, Veterinary Pathology, and Breeding, of which among others perhaps, the most important subjects, were those of Vaccinia, Tuberculosis, Cattle breeding and Phylloxera.

E. NOSTRAND, D. V. S.

After a practice of over fifty years in the city of New York, Doctor Elbert Nostrand, died of pneumonia on April 14, 1891, at the advanced age of eighty-three years and one month. Born in Springfield, Long Island, he, at an early age, began practice in New York city, and was one of the first American veterinary graduates, receiving his diploma in 1865 from the New York College of Veterinary Surgeons. Dr. Nostrand even at his advanced age, in fact, to within a few days of his sickness, was still in active practice, and many New Yorkers often met him but a short time before his death, in the performance of his professional duties.

REVIEWS.

"Tierärztliche Chirurgie, für Praktische und Studierende."

VETERINARY SURGERY FOR PRACTICAL VETERINARIANS AND STUDENTS.
 BY L. HOFFMAN, PROFESSOR AT THE VETERINARY SCHOOL, IN
 STUTTGART. PUBLISHED BY SCHICKHARD AND EBNER. PARTS
 I. II. III. IV.

A hiatus in Veterinary Science, especially in America, has been that of a good practical work upon Surgery of the Domestic Animals, one which, it might be said, was on a par with the best modern works on human Surgery. As the author is one of the noted German Clinicians, we greet with great pleasure the announcement of the publication of this work and rest with the hope and confidence that a great want is being filled.

This book does not appear as a complete volume, but in parts of which we have received, four. The material is divided in two parts, the first of which is devoted to *special* and the second, to *general surgery*; under the *special part* we find the diseases of the *head*, each being placed in its proper organic category, and most elaborately treated. There could be no better arrangement of the subject matter of this part.

The author omits all introductory remarks, and starts out with the work by giving the localization of brain function, and diagnosis of diseases of the same, with fig. 1, showing the different functional centers. Each topic treated upon is accompanied with a bibliography, giving reference to extensive literature on the subject.

Under the head of Diseases of the Nose and Throat, we find illustrated a most valuable instrument (the *Rhino-Laryngoskope*), by the use of which a thorough diagnosis of the parts is made possible. The first instrument made use of for this purpose in Veterinary Science was by Polansky and and Schindelka in 1889, but since then the instrument has been wonderfully improved and is now a most intricate piece of mechanism, though in appearance a simple tube with a bulb at its end. By its optical arrangement it is possible to see the most trivial streak on the mucous membrane reflected and highly magnified on the glass in the bulb on the outside. Through this great advancement it has been made easy to diagnose diseases heretofore very difficult. It is invaluable in the diagnosis of inflammatory diseases of the throat, glanders, compression of the larynx, roaring, etc.

The second part is almost wholly devoted to diseases of the *Eye*, and the able manner in which the author deals with the surgical affections of this organ bespeaks great experience.

There are 640 pages in the four parts of the work before us, with 100 illustrations, mostly original, and with a very few exceptions the cuts are as fine as it is possible to execute them on wood. We are unable to point out a single word of criticism in the diseases of the *thorax* and *abdomen*, which part is put forth in a very thorough manner, and the intelligent arrangement of diseases of the *bowels*, with special stress to those of the *rectum* shows the author's good judgment. It is impossible (in a description of this nature) to give the part of the work before us, the justice it demands, and

and we hope the author will finish the other parts of this grand work in keeping with the same standard, and thus usher into Veterinary Science a work which will be a monument to himself and a pleasure to the veterinarian.

The following is a translation of the author's Prospectus of the work :—

"Since the scientific reformation of surgery, the triumphs of which consists in antiseptics, arresting of hemorrhage, and anaesthesia as well as in microscopic diagnosis, there has not so much been done in the production of veterinary literature, as could have been expected, in comparison with human surgery, and corresponding to the importance of the subject.

Having become thoroughly intimate with the principals and workings of modern surgery, I have, in preparing the book before us, brought throughout, the new method, wherever my experience saw advantage in its application.

I have, however, through literary studies, gained the conviction, that the former, or now past surgery contains such a rich treasure of knowledge and experience, that the modern doctrines appear as some noble, mighty Scion grafted on the tree of former surgery. But as a green limb is only able to live when it remains in communication with the tree, so can, according to my opinion, modern surgery produce the most perfect results only through him who is perfectly acquainted with its issues. The knowledge and observations of our predecessors, appear to me as necessary for that purpose, as the tree is necessary for the vitality of the branch. For this reason I have made special and detailed researches into the literature. The practical object was my leading motive.

To govern the extensive matter in a regular way, I have divided the work into a *Special* and *General* part. The special part will appear first, so as to give immediately an idea in what way the real practice has been treated.

The Publishers deemed it best to publish the book in parts, of which it is proposed to issue from nine to ten, each of about ten forms. The manuscript is so far prepared, that the book will be finished within one year."

S. E. WEBER.

BOOKS AND PAMPHLETS RECEIVED.

THE 13th ANNUAL REPORT OF THE STATE BOARD OF HEALTH, of the STATE OF CONNECTICUT, for the year ending November 30, 1890, with the registration report for 1889, relating to Births, Marriages, Deaths and Divorces. Printed by the order of the Legislature, New Haven, Conn., 327 pages. In addition to other matter of general interest, is an article of 27 pages on Adulterated Food in Connecticut.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION to July 1889, Washington, Government printing office 1890.

TRANSACTIONS OF THE 22nd and 23d MEETING OF THE KANSAS ACADEMY OF SCIENCE 1889, vol. xii, part 1. Topeka, 1890, 189 pages, contains a study on the classification of the sensations of smell, By W. S. Franklin.

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No. 7.

THE BIOLOGY OF THE CATTLE TICK.*

BY COOPER CURTICE, VETERINARIAN,
MORAVIA, N. Y.

I present to you this evening specimens of the common cattle tick, *Boophilus (Ixodes) bovis*, Riley, illustrating the successive moults through which the young of this species pass.

The eggs for the experiment in which these ticks were bred were handed me one day last fall by Dr. Theobald Smith. A few adult ticks had been collected from cattle, dropped into an empty bottle, and set aside for a few days. One day he observed that there were also eggs in the bottle and called my attention to them.

On Oct. 10th, I placed some of these eggs in a small glass-covered dish filled with damp mould and set it aside in the incubating room of the laboratory. On Nov. 4th, the young ticks had begun to emerge and by Nov. 15th the hatching was completed, each egg having produced a young tick.

At this time the ticks were taken to the Bureau Experimental Station, and put on a calf which was confined in a stable, whose temperature was maintained at summer heat throughout the experiment. A calf with a white abdomen was selected, thrown on its back, sprinkled with ticks directly on its fine silky hairs, and time allowed for them to crawl into the skin. In this proceeding the certainty of the young ticks arriving at the most suitable surroundings was assured.

* Read before the Washington Biological Society, Feb. 3, 1890.

It is well to state here that the parents of these young ticks were the last seen at the station on any of the cattle, and that the room of experiment and the calf were quite free from ticks before the experiment began. The following table will serve to illustrate the sequence of events in the experiment and present it in rough but compact form.

Experiment No. 1.—Breeding Ticks.

DATE. 1889.	STAGE OF EXPERIMENT.	TIME CONSUMED IN VARIOUS STAGES.
Oct. 3.	Egg laying begun.	
Oct. 10.	Egg laying finished.	Ovipositing one week.
Nov. 4.	Ticks appeared.	Hatching three and four weeks.
Nov. 15.	Rearing begun.	Unnecessary interval of one week.
Nov. 22.	1st moult, larva to nymph.	Larval stage lasted one week.
Nov. 29.	2nd moult, nymph to adult.	Lasted one week.
Dec. 11.	Female $\frac{1}{2}$ grown with male.	About two weeks later.
Dec. 16.	Experiment closed.	About one week.
	Experiment endured.	About two and one-half months.

Having briefly reviewed the experiment we may now study its products.

The eggs were laid in a little mass; were subovoid, dark brown and opaque and coated with some protective substance. In alcohol they show a thin shell-like covering with a dark opaque mass within. In the latter stages of incubation the form of the young ticks became more and more apparent until they emerged. The exit from the shell seemed to be by the shell rupturing and the imprisoned occupant thrusting it off with its feet. The torn edges afterward rolled inward and produced the appearance of clam shells, so frequently mentioned in writings on this subject.

The anatomical differences of the ticks in their stages will not be discussed further than to point out the gross characters. There are changes which take place in the mouth parts, but these are of such character as to require elaborate drawings and detailed descriptions, and are necessarily omitted.

The young ticks or larvæ when they emerge are whitish, they gradually turn to chestnut brown and resemble minute seeds. Though I have never seen the seed-ticks of the South since I have begun to study them from a standpoint other than to rid myself of them, I think that the young of the cattle tick may form a large portion of them.

The date of the first collection, Nov. 22nd, was a week from the time the young ticks were put on the calf and very fortu-

nately coincided with the time of the first moult. Specimens were taken which showed the tick nearly ready to emerge from the old skin through which they could be seen. The larva (Megnin) is six-footed, possesses no sexual organs and wants the large single stigmata found in later stages. I think it breathes through the three stigmata-like dots I have observed on the side just behind each pair of limbs, but I have not yet made all the sections and examinations necessary to sustain this point. The digestive, urinary tracts, and cloacal pore are present, and apparently vary little in the successive stages.

The next or nymphal stage as seen through the skin of the larva has added a pair of limbs behind the others and a pair of large stigmata behind them. The additional legs lie along the sides in a loop with its convexity directed caudally. The contents of the three front pairs of legs, have withdrawn until only their white tips remain in the test about to be moulted. The head itself is withdrawn from the external skin and the mouth parts seem to be entirely disconnected from it.

Moulting in this stage is completed by the testa first splitting along the side in the vicinity of the head, the feet being thrust out through it, and the dorsal and ventral halves torn apart by the force of the limbs. Specimens of the loose valves, and a tick with its feet thrust through the slit near the head, which are now in the Bureau collection, demonstrate this satisfactorily.

In the change from the larval to the nymphal stage there is a complete ecdysis accompanied by the addition of new parts. The change is, therefore, incomparable to the stage of metamorphosis in insects, and the terms *larva* and *nymph* can only be used in a restricted sense as applied to these stages as being analogous, but not homologous with those stages bearing the same names among the insects. The important changes at this moult occur in the locomotory and respiratory organs.

The next specimens were collected a week later on Nov. 29th. The collection contained individuals about to change from the nymphal to the adult stage which, like the others, could also be seen through the testa they were about to shed. I had previously been enabled to study this stage from field collections, but the specimens collected at this time were invaluable in completing the life-history of the ticks as learned from a single brood.

The moulting at this period is complete. The limbs and head are withdrawn a little from the old testa. The valves split along the sides as in the earlier moult. The digestive and respi-

ratory and locomotory organs undergo little, if any, modifications. The greatest change occurs in the reproductive organs which have developed during the nymphal stage and assume their functions immediately after the ecdysis, when the genital orifices appear in the new skin. Beyond this and the more decided adult characters offered in conformation there seem to be no essential changes.

After this moult the couples mate, and while the male grows but little, if any, afterward, the female continually increases until she reaches the comparatively gigantic size which nearly all are familiar with. They pass through no other moult. The stages passed through by the ticks are therefore four: the egg, the larva, the nymph, the adult. The moults are two: from larva to the nymph, and from the nymph to the adult.

In presenting these few observations on the moultings of the cattle tick I have avoided entering into details on the one hand, and into the broader field of comparative work on the other. The points that I have endeavored to present are:

1st. That cattle ticks can be bred in the laboratory and under comparatively simple surroundings which, during certain seasons of the year, occur everywhere within the cattle tick area.

2nd. That the ability of young ticks to attach to the calf and their subsequent rapid increase in size demonstrates that they may be true parasites whose development can only take place immediately after they become parasitic. Specimens of the same breed reserved in the incubating glass underwent no change, although kept until after the rearing experiment was terminated. Field collections, comprising all stages from larva to adult, also sustain this view.

3rd. That the tick passes through four stages, viz.: 1st, egg; 2nd, larva; 3rd, nymph; and 4th, adult. (a) That in the egg the protective, digestive, respiratory, urinary and nervous systems are developed, or those systems which are essential to individual life. (b) That at the end of the larval stage there is an addition to the locomotory apparatus and important modifications in the respiratory system, which appear in the nymphal stage. (c) That in the nymphal stage the most important changes lie in the development of the generative system, or that, essential for the preservation of the species. (d) That in the adult few important changes occur, except those in form which more strongly define the sexes.

The novelty of this communication consists in the presenta-

tion of a series of ticks from a single brood, which demonstrates the life cycle of a single species, and of descriptions and drawings of the important stages which have been fairly well outlined by earlier observers from their field collections. These drawings are now in the Bureau collection.

Aside from the purely biological interest excited by the above is the practical one of the relation of the tick to Texas Cattle Fever. Having learned to breed the ticks in quantity I conceived the experiments of taking Northern calves and placing young ticks upon them to determine the extent and kind of injury that the ticks should cause their hosts. These experiments were planned for the summer of 1890, and were sanctioned by Dr. D. E. Salmon, the Chief of the Bureau of Animal Industry, where I was then employed. I, however, was sent to another field, but not to the detriment of the experiment, for I found on my return that they had been carried out on quite a large scale as detailed in the Report of the Secretary of Agriculture for 1890 (p. 109). While Dr. F. L. Kilborne, of the Bureau, had experimentally shown the year preceeding (1889) that ticks had something to do with Southern Cattle Fever, there was, after all, no way of better settling the question than by placing young ticks hatched from the egg directly upon hitherto uninfected cattle. The results of experiments, as carried out by Doctors Smith and Kilborne, showed that Northern cattle purposely infected with cattle ticks afterward presented all the symptoms of Southern Cattle Fever together with the protozoan parasite which Dr. Smith claims to be the cause of the fever.

Boophilus (ox loving), is a name I applied as a generic name for these ticks in a paper on "The classification of American Ticks" (illustrated), and read before the Washington Biological Society, December 27, 1890. In the proposed genus the *rostrum* and *palpi* are very short; the *capitulum* is wider than the combined width of the *palpi* and *rostrum*; the second and third segments of the *palpi* are nearly equal and *each widest about the middle where the sides project in an angle*; eyes are present. Koch (in Uebersicht des Arachniden System, Zecken), seems to have figured this or nearly related species under his genus *Hemaphysalis*, but so defined the genus that late authorities on the *IXODIDÆ* include quite other forms of ticks in it. As this species cannot be classified with forms having the *posterior border of the second joint* projected laterally, I have created a new genus.

Prof. C. V. Riley, in 1869, Govt. Rept. Diseases of Cattle by

Gamgee, was the first to furnish a good, unmistakable description and figures, excepting the male, of this species. There is a possibility, however, that his description may have been antedated by Koch (1844) who described *Hæmaphysalis rosea*, from Cuba. and by Say (1820) who described *Ixodes annulatus*, from Florida. *Boophilus bovis* is the only species in this country that I have so far met with to which the characters of *Ixodes annulatus* apply. The above descriptions of Koch and Say are so imperfect that it seemed preferable to adopt the later description.

More lately, Megnin, in his volume on parasites (1883) has described a tick from Algerian cattle as *Ixodes dugesii* which seems to be our *Boophilus bovis*. I have, through the great courtesy of Prof. A. Raillet, of Alfort, received, among other parasites, specimens of ticks from Egyptian cattle. I cannot find a specific difference between the specimens of males and females received from Egypt, and specimens of our *Boophilus bovis*, on direct comparison.

In view of the exact specific identity of our cattle tick with that from Egypt, and the method by which the Southern cattle have been introduced in the early Spanish invasion, and from the fact that the tick completes its development from six-footed stage to adult on cattle, it seems to me that the common cattle tick of the South, *Boophilus bovis*, is an *introduced* species, having been introduced early in the sixteenth century into the Spanish settlements of America. The species thence spread with the cattle into all those parts where the climatic conditions were suitable.

If cattle ticks produce Southern Cattle Fever the bearing of this distribution upon the fever question is seen to be quite important. For South Americans and Algerians, probably, and Egyptians, certainly, having the same fever-producing tick, should have, if the theory of the relation of the tick to Texas fever be correct, the same cattle fever due to the tick.

In the probability that the ticks have been introduced, there is, if the experiments of the Bureau of Animal Industry have been interpreted correctly, also a probability that the Southern Cattle Fever, which also used to be called Spanish Cattle Fever may have also been introduced from the Old World.

The presence of the tick in northern Africa and southern Europe and northern South America, unassociated with a disease similar to our Southern cattle fever, would be very good evidence that the tick was not connected with the well known scourge as exciting cause. Until more is known about the relation of

ticks to disease of cattle in those countries few deductions can be made.

It is possible that with an increasing traffic in cattle between Algeria and France we may yet learn whether native French or English cattle may be taken with impunity from a disease similar to Southern Cattle Fever, to Algeria, and whether Algerian cattle may be pastured with Northern cattle with no danger to the latter.

So far as my information extends the traffic has so far extended to the shipment of cattle from Algeria for abattoir purposes alone. The extensive interchange of feeders or stock cattle from one field to another as practiced in this country has apparently had no following on the other side, and hence they have been quite free from any untoward results.

DOES MENIÈRE'S DISEASE OCCUR IN HORSES?*

BY GEORGE FLEMING, C.B., LL.D., F.R.C.V.S.

We know but little of the neurotic disorders of the domesticated animals, and are probably correct in inferring that they are very few in number, as compared with those affecting mankind. To account for this difference, we might invoke the extremely artificial life imposed upon our species, and especially upon dwellers in large towns; the highly-developed state of the nervous system, and the strain—mental particularly—to which it is subjected; the deteriorating effects of certain morbid conditions upon it—chiefly those due to Syphilis, Alcoholism, and Gout—as predisposing, if not immediately exciting, causes of various neuroses of a more or less serious character which find a prominent place in text-books on human pathology. Mental diseases veterinary surgeons have seldom indeed to contend with in animals, unless it be vicious temper, due to mismanagement, rarely to natural defect.

Therefore it is that the list of neurotic affections known to us is indeed small, and attracts but little attention. But these may be more numerous than we suspect or realize, for we labor under a

* Read before the Central Veterinary Society on May 7th, Vol. xxxii.

great disadvantage in several respects in dealing with animals, and more especially in their not being able to describe their feelings by articulate sounds, when suffering from pain or inconvenience; and also from their being generally under our observation for only very brief periods, during which it is not possible to note everything that might lead us to form anything like an accurate notion of what may be amiss—symptoms of a morbid condition not being always present in the same intensity or form, and our means of investigation being generally exceedingly limited and imperfect.

For these reasons it is that the vertiginous disorders of animals are badly defined, and in the horse more especially are usually ascribed to two or three causes—as indigestion, cerebral tumor, or deranged circulation in the nervous system. But the observation of two cases which occurred in my own experience, inclines me to the belief that animals may suffer from vertigo due to some derangement in the auditory apparatus, similar to what occurs in man in what is known as "Menière's Disease," or technically, "Labyrinthine Vertigo"—an affection characterized by sudden attacks of giddiness, which are preceded or accompanied by noises in one or both ears.

As described in medical text-books, the commencement of one of these attacks in a person is marked by a sudden buzzing or humming sound in one or both ears—usually loudest in one. This is soon followed by vertigo, which may be either objective or subjective; or the patient may experience a sensation of falling, generally in a forward direction, but sometimes backwards or to one side. The individual reels and clutches at neighboring objects, but rarely falls; though occasionally he may do so, or in severe cases may be thrown violently to the ground. There is some doubt as to whether there is ever loss of consciousness; if there is, it is only momentary, as the patient can always give an exact account of his sensations after the attack is over.

The attack usually lasts a few minutes, and passes off gradually, leaving the patient deaf and with noises in the ears. Towards the end of the seizure he is pale, with a cold, clammy skin, and often experiences nausea, or even vomits. Lateral nystagmus is sometimes present during the attack, and apparent movement of objects from side to side is complained of. Subsequent attacks are liable to come on at varying intervals, and are generally announced by an increase in the tinnitus or ear-noise, which is generally more or less present. Indeed, a shrieking or a whistling noise is a

common precursor of an attack. The intervals between the seizures gradually become shorter, until the patient is reduced to a state of permanent vertigo, liable to exacerbations. The deafness gradually becomes more marked and the tinnitus less observable. In some cases a spontaneous cure is effected when the deafness becomes absolute, the vertigo then disappearing. It is stated that vertigo, tinnitus, and deafness, when combined in one person, generally indicate an affection of the auditory labyrinth, either from actual disease—inflammation or hæmorrhage—or from disease of the middle ear causing pressure on it; but it is also admitted that obstruction of the Eustachian tube or of the external auditory meatus, as by the accumulation of cerumen, may give rise to the same symptoms.

It must be noted, however, that some medical authorities do not regard Menière's disease as a severe form of Labyrinthine Vertigo, but rather as a distinct affection. According to this view, it is characterized by a sudden and severe attack, such as that just described, in a person who had no previous ear disease. The seizure may never recur, and the disturbance is nearly always confined to one ear; while the deafness is intense. The tinnitus and giddiness diminish or cease after the attack, and there is no evidence of disease of the middle or external ear. In Labyrinthine Vertigo, on the other hand, it is asserted that there is usually pre-existing ear disease and severe tinnitus, with more or less deafness; the attacks are less sudden and more frequent, and the giddiness is not so great, but it is more chronic. Fagge believed that in true Menière's disease, there is no affection of the labyrinth or cochlea of the ear, but some disturbance of the centres for hearing and equilibrium.*

Diseases of the ear are not common in our patients, for with the exception of the dog and cat, in which the external ear is frequently in a morbid state, we rarely have derangements in this organ brought to our notice. Yet it is on record that affections of the external ear will induce symptoms in the dog and cat, analogous to those described as indicating the existence of Menière's disease or Labyrinthine Vertigo in man. Mégnin was the first, I believe, to direct attention to the fact that acariasis of the external ear will often produce epileptiform fits in cats; and Nocard has noticed the same result from the same cause in dogs. My friend, Mr. A. J. Sewell, M.R.C.V.S., informs me that in his experience cats

* Fowler's Dictionary of Practical Medicine, p. 511.

very frequently suffer from the presence of a small parasite, about the size of an ordinary acarus, in their ears, and which sets up such "tremendous" irritation that the poor animal will suddenly shake and scratch its ears, and when walking will go as if intoxicated, often falling on its side. Mr. Sewell has found the same parasite in dogs' ears.

I could detect nothing of this kind in the ears of the horses whose symptoms I will now refer to, and which appeared to me to bear so close a resemblance to some of those that characterize Menière's disease, that I have been induced to bring the question before you as to whether the equine species suffers from it. The affected horse unfortunately cannot describe his sensations, and we are therefore left in doubt as to whether they are the same as in man; but, judging from appearances, we might conclude they are at least somewhat similar.

The first case to which my attention was directed, occurred so long ago as 1865, when stationed with one of my old regiments—the 3rd Hussars—at Aldershot. The horse—a dark brown gelding, rather old, if I remember aright—was off-side wheeler in the regimental drag, and had been bought at an auction in London. The officer who usually drove the drag asked me to examine the horse's left ear, as he said that when on the road the animal began to shake his head and incline it to the left, as if a fly had got into the ear and could not be dislodged. On several occasions the drag had to be stopped as the horse staggered towards the left side and could not go on. On one occasion, when urged to proceed, the horse became greatly excited and fell, and it was some time before he could be sufficiently recovered to bring him home. A careful scrutiny of the external ear, inside and out, could discover nothing to account for the symptoms; the teeth were examined, as well as the jugular veins, but they were normal. Another bridle was worn, and the horse's place in the coach changed, but all was of no avail, and as the animal gave so much trouble, he was sold. The shaking of the head and vertigo were ascribed to Megrim.

The next case presented itself in a horse of my own, when with the Royal Engineers at Chatham, 1876. The animal was an Irish hunter, seven years old, which I drove in double harness, as the hunting season was over when I bought him. He ran on the off side, and was a showy and steady horse at work. Soon after I began driving him, I found he was seized in the same way, when on the road, as the other horse had been.

When going along quietly, he would suddenly give a start, become excited, shake his head rapidly and convulsively towards the left side, carrying it much as a horse does when a twitch is severely applied to one of its ears, or as if something very irritating had entered the ear. At the same time, he pressed against the pole on the near side with such force as to drive the other horse off the road into a hedge, and then fell. The groom was quickly at his head, and we released him from harness. He did not appear unconscious, but stupefied, and his eyes moved as if he were much startled. In a few seconds he got up, but was so much depressed and agitated that we did not put him again to the carriage for some time. He would not drink water, which was procured from an inn not far off; and bathing his head did not appear to benefit him much. Next day I made a most particular examination of him, but could detect nothing whatever to cause the peculiar and alarming symptoms. The condition was not what is commonly known as Megrim, neither was it Epilepsy, several well-marked cases of which I had previously seen. The horse was otherwise in excellent health and condition.

He was put under treatment, as it was imagined his digestive apparatus might be at fault, and his allowance of oats was reduced. But this had no effect, as the next time he was driven he exhibited the same symptoms; but he was timeously pulled up, and the groom got to his head to support him; and though he had pushed the near side horse across the road, yet he was prevented from falling. This occurred several times at intervals of a few days.

Whether he was liable to these attacks in the stable, I could not learn, as the groom did not observe them there; and as I did not use him in the saddle, I am in doubt as to whether he would show the peculiar symptoms when ridden. At any rate, the condition were so alarming, and even dangerous, that I was obliged to dispose of him, as I could not afford to destroy him and make an autopsy, much as I desired to do so.

Under the heading of "Irritation in Horse's Ear," a correspondent to *The Field* of May 2d of the present year, writes: "Can any of your readers tell me the cause and the best treatment for the above? The horse is seven years old, and appears perfectly healthy; but about six months ago he first showed signs of irritation, by shaking his head and putting his near ear down. The last month the irritation has increased, and in harness now he will stop, shake his head, and twitch his ear severely. It more

frequently appears when he is warmed up, or when meeting a cold wind. When riding it affects him just the same, but when I see it coming on I rub gently behind the ear, and in a minute or so it passes off. I have tried washing the ear with carbolic acid, and have also applied lead liniment. There is nothing to be seen, the ear being perfectly clean. A local veterinary surgeon has examined him, but cannot detect the cause." The writer subscribes himself "Puzzled."

From the symptoms I have given of Menière's disease in man, and those I have detailed as offered by the two horses which came under my own personal observation, it will be seen that there is some reason for assuming that animals may be affected with Labyrinthine Vertigo, though what its immediate or remote causes or termination may be in them I cannot say. These certainly were not cases of ordinary vertigo. The sudden excitement as if startled by a loud noise or sharp pain; the persistent and increasing shaking of one ear, and inclination of the head to the same side; the tendency to turn round or push to that side; the stupefied and alarmed look, and the falling on that side if not quickly pulled up and supported, are indications that go, as far as is possible in dumb animals, to support the opinion I have ventured to express with regard to the existence of Menière's disease in other creatures than man.

Doubtless many members of the veterinary profession have witnessed such cases and been struck by their peculiarity, but I can find no mention of any attempt to assimilate them to, or compare them with labyrinthine disorder in the human species. Disease of, or derangement in, the organ of hearing in horses, must be exceedingly rare, though they are frequent in dogs and cats; and, as has been mentioned, acariasis of the external ear in these animals occasions symptoms not unlike those described. But in the horses I have alluded to, there was nothing whatever discovered to account for the attacks to which they were liable. Whatever the cause may have been, it was not always an operation, as the fits only came on at uncertain periods and, so far as could be ascertained, during work.

The function of the semicircular canals of the middle ear is doubtless closely connected with movement, or the consciousness or co-ordination of movement, as Flourens long ago demonstrated; for some of them causes loss of equilibrium and disturbance of locomotion; and if this section is made only in one ear, then the disturbance in equilibrium and movement occurs on that side. In

the cases I have described, if the cause was really located in these canals, it may have been variation of pressure on the fluid they contain, due to some disturbance in the blood circulation or modification in the temperature or amount of air in the Eustachian tubes.

However this may be, certain it is that we have here a form of vertigo that has not been, to my knowledge, described; and whether it is altogether neurotic, and due to some morbid condition of the cerebellum, or it is the consequence of some derangement in the auditory apparatus, is a matter for investigation. I cannot think that such cases are very rare, and it is possible for some one to have the opportunity of making a careful examination of a living horse so affected, and to have the advantage of a skilfully-carried-out autopsy upon it, so that we may learn the true pathology of this condition.

With regard to treatment, I am sorry to say I cannot give any information; for until we can ascertain the cause of the malady, any remedial measures adopted must be more or less of an empirical nature. Those applied to man cannot be utilized for the horse to the same extent. It may be mentioned, however, that with man large doses of quinine have appeared to give good results. But until we understand the ætiology of the malady, we must remain in the dark as to the proper means to be prescribed for combating it.

REMEDIES.

Dr. Herbert Neher, Veterinarian of the Broadway and Seventh Avenue R. R., New York, finds that in treating cases of Influenza "in green stock" (Horses), if there is any tendency to gastric or enteric trouble, "Sour Stomach or purging", the use of the following

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is most successful. He gives three or four in the 24 hours. He likes it better than Tinct. Opii and similar preparations.

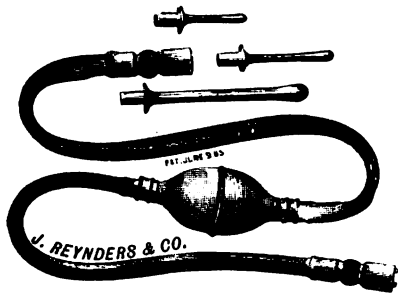
In Purpura Hæmorrhagica, he injects ⅓ grain doses of Strychna every four hours and has had excellent results; after the cases are on a fair way to recovery, he gives Iron, Quinine, etc.

He inquires if, after removing the sole or wall of the foot (in horse), any of the readers of *THE JOURNAL* have tried Dried Sulphate of Iron, dusted on. He finds it forms a crust or scab, excludes the air, has a soothing effect, and is tonic in its action, on the parts.

In flatulent colic, when the pelvis is filled by the colon "due to pressure," he punctures through the rectum and saves a wound in the flank. A precaution is necessary however, and that is to keep hold of the canula, for when the gas escapes it recedes with the gut, and if it should slip out of the hand, serious consequences may result.

He always gives a full one ounce of aloes. to a horse in full condition, as soon as he enters the Hospital, and uses injections per rectum; and, if the pain is unbearable, etherizes the injection, which seems to have the desired effect.

In Spinal Meningitis when the urine has to be drawn with a catheter, he washes the bladder through the catheter, using a rub-



ber syringe with a bulb, like figure, and after the urine is drawn and the bladder washed, he injects a proper amount of Tinct. Nux Vom., which, in coming in direct contact with the mucous surface, seems to tone the parts and they soon regain strength to contract and produce natural micturition.

TRAUMATIC HERNIA.

BY J. WALLACE MARSH, D. V. S.

A ten days' old colt was injured by being hooked by a cow; the horn penetrated the abdominal cavity on the right side about three inches from the median line. The intestines escaped and reached nearly to the ground. The intestines were covered with

sawdust from the litter of the paddock, they were greatly congested and swollen; the mesentery was torn and showed a hole an inch in diameter. I saw the colt about an hour after the injury and gave the following treatment. It was laid on a linen sheet, the intestines were carefully washed under a carbolized spray; the opening was enlarged and the intestines were slowly returned. The internal coverings were closed by buried cat-gut sutures, and the external by quilled suture. The wound was then covered by antiseptic cotton and the abdomen was wrapped with a wide linen bandage, which was well secured. The colt was kept on its side until the next morning, when it was assisted to its feet, but after that required no assistance. The dressing was not disturbed for forty-eight hours, when the wound was found closed. The quilled sutures were removed after four days. No swelling was present at any time; the wound was kept covered with antiseptic cotton. At the end of fourteen days the wound had completely healed and the colt was allowed its liberty. The colt and mare were then turned to pasture.

This proves to me that where the cat-gut suture and the thorough use of antiseptic dressings are employed, the least interference with the wound the better, especially in injuries of this nature.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VET.

[Continued from page 285.]

ACCIDENTAL IRREGULARITIES.

Accidents from various causes, injuries, wounds, fractures of the jaw bone, with or without loss of the teeth, and abnormal growths, may so interfere with mastication on one side of the mouth, that they cause an excessive wearing of the teeth on the other side.

Vicious, nervous and irritable horses frequently bite at their mangers, chains, wagon pole or other foreign bodies and chip off the edges of the incisors, or they may even wear them to a

considerable degree, so as to greatly change their form and tables, and interfere more or less with the characters from which we judge the age. In any of these cases, however, the cause is evident, and the unilateral wearing, or the rough, irregular loss of substance can be replaced by the imagination, and the accurate age determined.

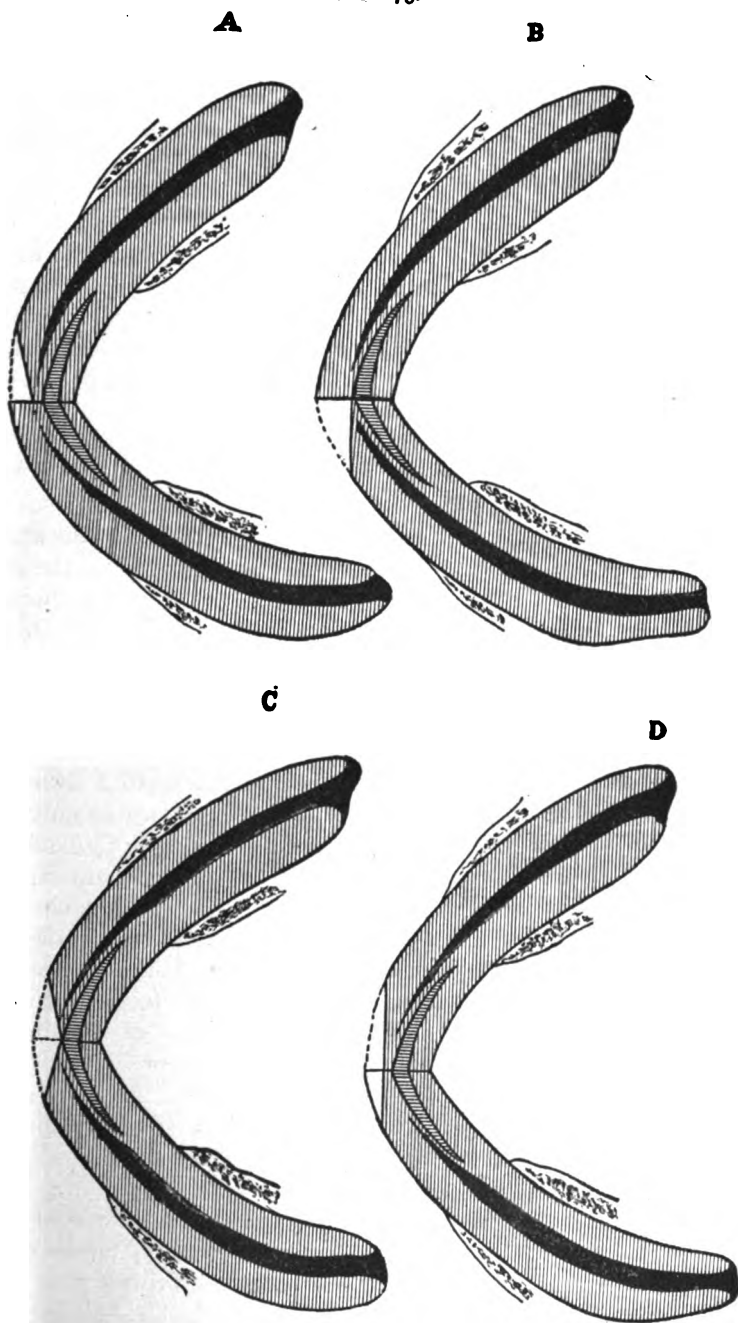
IRREGULARITIES FROM CRIBBING.

Cribbing is recognized as of two kinds: 1st, that of the wind sucker who pursues the habit, nose in air, and consequently produces no abnormal wearing of the teeth; and 2d, the cribber, who requires some foreign body between its teeth, and wears them at the point of prehension. For the former M. Goubaux proposed, in 1866, the name of "æropinic."

According to the manner of cribbing, and the character of the object, which the horse chooses for support of the teeth, the wearing of the latter may be much varied. The object seized may be the feed box, the rail of the manger, or a part of the stall, which may be horizontal or may be vertical; it may be the end of a poll or shaft, a chain, hitching strap or part of another horse's harness; in one case of the writers, the horse would only crib on a small piece of wood when hung loose on a cord. Rare cases crib by seizing their own legs. Sometimes the support is only taken with the lips or the tuft of the chin, and in these there is no wearing of the teeth.

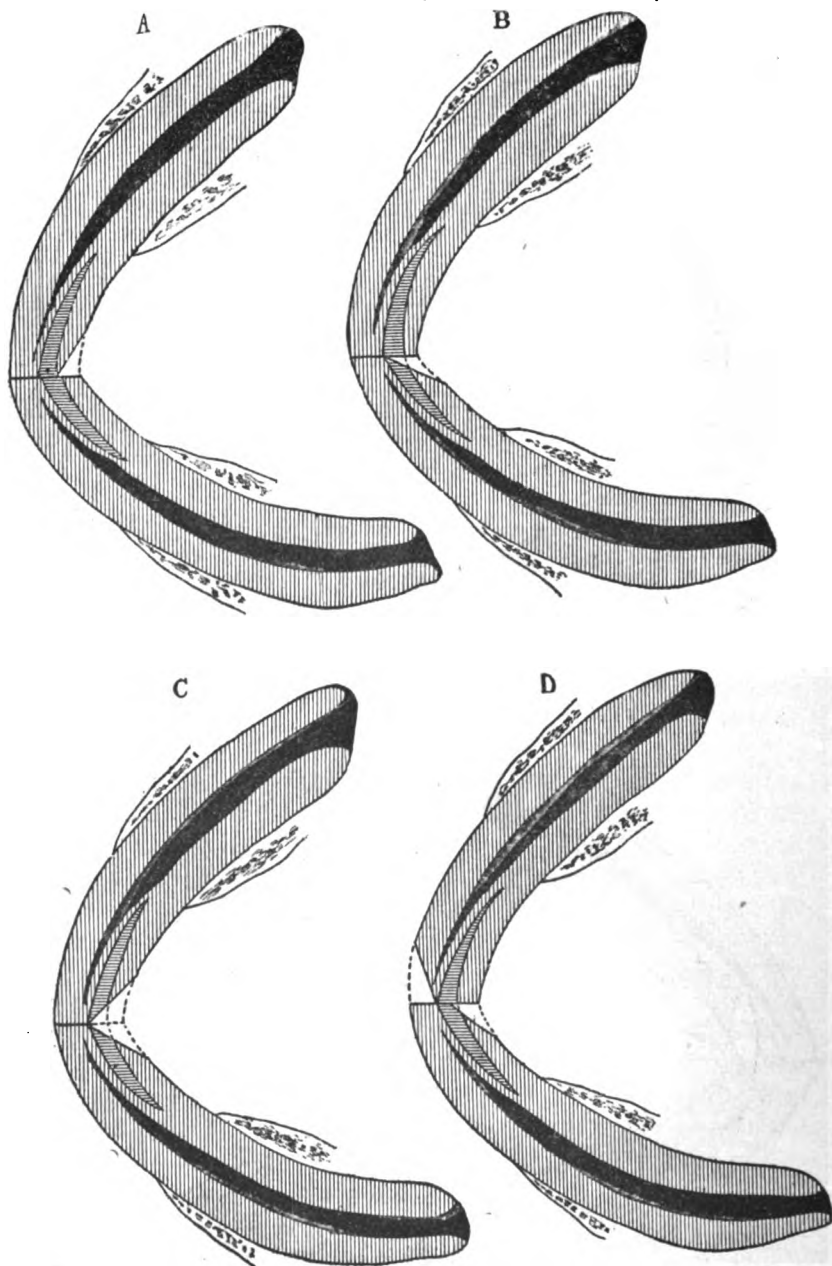
According to the size of the object, or the position assumed by the horse in cribbing, the contact of the teeth may be only by the anterior borders, only by the posterior borders, or by both; it may be by one jaw or by both; it may be by a number of teeth, or only by one or two teeth. In whatever manner the cribbing is done, but little force is used, and the worn surface of the teeth is smooth, even and polished, so that it is readily distinguished from the roughened edges of teeth worn by vicious or nervous biting. When the support of the teeth has been taken, the animal makes an effort of deglutition, which is followed by a peculiar "cluck" sound. In examining an animal, even where the age is readily recognized, care should be taken to open the jaws completely so as to inspect all surfaces of the teeth. While cribbing marks, when on the anterior face of the teeth, are apparent on superficial examination, those on the posterior face, are often hidden by the foam and saliva, unless care is taken to wipe the latter away. A slight bevel worn on the

FIG. 75.



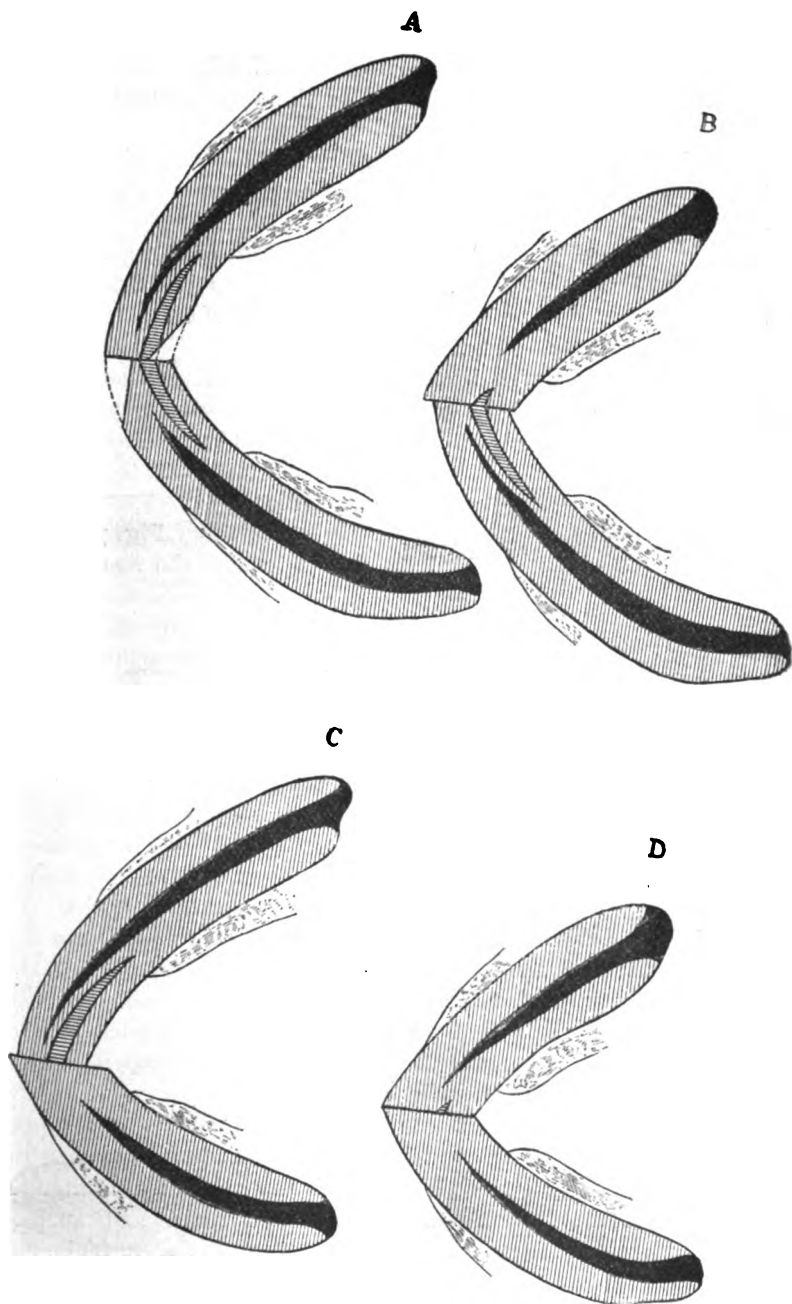
CRIB MARKS, BY PRESSURE OF THE TEETH AGAINST FOREIGN BODIES.

FIG. 76.



CRIB MARKS, BY SEIZING FOREIGN BODIES INSIDE OF THE JAWS.

FIG. 77.



CRIB MARKS.—A, THE REVERSE OF FIG. 76, D. B, C, AND D, WEARING OF WHOLE TABLE, UPPER, LOWER OR BOTH.

anterior surface is evident, with the teeth closed, from the separation of the enamel, and the presence of a yellow line, made by the exposed dentine, while a considerable bevel might be overlooked when its surface is a continuation of the yellow dentine of the table and is looked at from in front.

When the animal cribs by pressing the incisors against some foreign body, the wearing takes place on the anterior face of the teeth (Fig. 75, A, B, C, D).

When the object is seized in the mouth it may wear only the posterior faces, (Fig. 76, A. B. C.); or if a turn board or similar body is held, it may wear the anterior borders of one jaw, and the posterior of the other, Fig. 76, D and Fig. 77 A.)

If a thin object is seized evenly between the jaws, the tables of the upper or the lower, or of both sets of incisors, may be worn. In the latter case the age must be determined by the thickness of the maxilla, the obliquity of the shortened teeth and their size as they emerge from the gums. (Fig. 77, B. C. D).

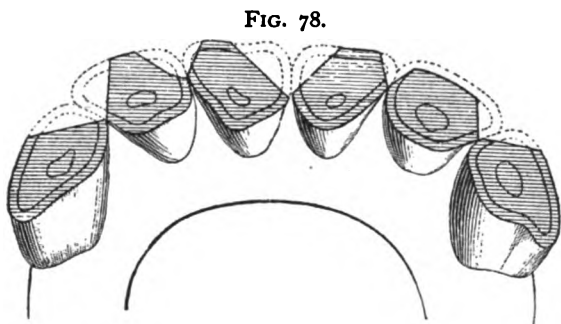


FIG. 78.
CRIBBING, ON VERTICAL EDGE OF FOREIGN BODY, OR ON HALTER STRAP.

Fig. 78, shows the wearing produced by vertical objects, halter straps, which the animal renders tense by backing to its full length, wires, small chains, etc.

Most horses crib only on a given character of object, and when removed to another stall, or fastened so that they cannot reach the regular resting place, may stop the habit for a time or be broken of it entirely. Others will sooner or later find some other body that suits them and recommence, so that the same animal may have two sorts of crib markings. Others, when tied up, will learn to crib in the air.

The rasp and file are sometimes used by dealers to shorten the incisors, and, while adding a little to the apparent age of the animal, remove the bevel which shows the habit of cribbing. A careful examination will always show a roughened surface, however, unlike the smooth polish of a naturally worn table.

[TO BE CONTINUED.]

LOCOMOTOR ATAXIA IN THE HORSE.

BY LOUIS MAGNIN, VETERINARIAN.

11TH CUIRASSIERS, FRANCE.

(Translated.)

There are diseases of the spinal cord like those of the eye; they are still but little understood by the veterinarian. A large part of the diseases of the eye, which are subject to relapses or which give rise to sympathetic troubles of the other eye, are generally confounded with periodic ophthalmia; so, in diseases of the spinal cord, a certain number of morbid enteties are attributed to three or four diseases with which they have no relation, either from an anatomo-pathological point of view or from their character; for example, take the vulgar strain of the back, which, according to M. Trasbot, show often, for alterations, a sclerosis of the spinal cord.

The first notice of locomotor ataxia in the horse, is by Messrs. Weber and Barrier; it is very complete (*Recueil* 1884). The 13th Volume of the *Recueil de Memoires et Observattons sur la médecine vétérinaire militaire* contains two others. One, from Principal Veterinarian Foucher, resembles very much the preceding case; the other, reported by M. Pernet, Veterinarian 25th Artillery, (France), differs in the remarkable peculiarity, that the disease was caused by a lightening stroke, and was cured in a comparatively short time.

I have to report another case. On March 20, 1889, a light-grey gelding, nine years, belonging to the 7th Cuirassiers, came into the infirmary for colic, which it had frequently had before. This horse had always been difficult to mount; before the rider was seated, it would kick vigorously, which I believe indicated a certain amount of pain in the lumbar region.

For two days, the colics were dull; the animal laid down and got up occasionally, but at long intervals. At the end of three or four days, the disease was no better, the animal was dull and dejected, the mucous membranes were slightly congested and yellowish. A pulse of 65, was strong and full. The loins were nearly insensible. In the stable the patient stood with its back arched and its legs drawn together. In trying to move it, its gait

was unsteady and difficult; keeping the same position, as when at rest, it walked with short steps, but the hind legs were lifted high, like those of a horse with stringhalt, but less brusquely and jerky. The horse stretched frequently to stale; but was only able to void a very small quantity each time.

Trouble of the kidneys or of the bladder were suspected. Rectal examination did not confirm this diagnosis and the urine was found normal, no trace of albumen or casts. The general condition improved for a few days, when a relapse followed, colics for a short time. Again an improvement, the organic functions became regular, except that of locomotion.

The gait was peculiar, and could not be attributed to a nephrito-cystitis. The front legs had normal play. The movement of the hind legs was peculiar and abnormal. They were advanced under the body, which was arched; they were lifted by a quick flexion of the hock, and then carried forward by an energetic jerk, like the action of a *stepper*, they rested in the air an appreciable instant and then fell heavily to the ground.

The movements were not regular, or coördinated—they were made as if the horse did not know how to walk; he threw, rather than carried the legs forward. There was at times a sudden flexion of the hind leg at rest, the horse stumbled, and nearly fell; in walking the hind quarters swung from side to side.

If taken in a circle the difficulty of movement was greater. Blinders rendered the gait still more unsteady.

The loins showed a greater sensibility than normal on pressure, the hocks flened and the hind quarters dropped, and only returned slowly to their natural position. The irregularity of gait became greater. On April 8th, the rapid flexion of the hocks and the arching of the back were less noticeable than at first, but the incoördination of movement had extended to all four legs. The hind legs were worse and made a veritable zig-zag; the hind legs struck each other and struck the fore-legs. Apparently unconscious flexion of the legs, at rest, or just when brought to the ground took place, and the animal frequently tumbled. The trouble became slightly better with exercise, but a trot was impossible.

If the horse was blindfolded, he seemed nailed to the ground; he could only have moved with the greatest difficulty and threatened to fall at each step. The trouble was worse in the right diagonal biped, and the animal always fell on the left side.

In drinking, after several swallows, the legs were drawn under, as in colic; he wanted to lie down and stretch the head on the ground, with a prolonged moan. After a few minutes of rest, he returned to drink. This was repeated for several days, each time he drank slop feed, but never with dry feed.

Erections were frequent, he reared and imitated the act of copulation; once, he tried to cover a mare near him; while venereal desire may occur with gelding, it had not been a habit with the patient.

About April 20th, the disease became stationary, and a few days later there even seemed to be an improvement. On exercise the shoes were frequently pulled off. The improvement was, however, only relative, it was simply an intermission.

The general condition was always good.

There was never cutaneous anaesthesia, or hyperæsthesia. The head was carried high as in the case observed by Weber and Barrier. Sight and hearing were perfect, and seeing him at rest, one would not suppose him ill. The organic functions were regular; pulse 46, temp. 38.2° C., resp. calm, but slightly accelerated on exercise; defecation and micturition were natural.

With little chance of efficacious therapeutics, he was condemned June 20. He was however seen later, the incoördination was more marked, he fell frequently, but was sold later to a dealer and disappeared from observation.

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Although we have not been able to recognize in this case the severe and lightening like pains, so common in man, we do not hesitate to determine this to be a case of locomotor ataxia. From the observations of Weber, Barrier and Foucher, the lesions of locomotor ataxia in the horse are not as *systematic* as in man.

By analogy we are authorized to presume, that this case ought to have alterations of the superior cords of the spinal marrow. The colics at the commencement, which seemed to arise from the urinary apparatus, were analagous to the vesical pains in ataxia in man. The moans after drinking, were analagous to the gastric crises in man. The venereal desire was identical to the erections in progressive locomotor ataxia.

DICEPHALUS-BICOLLIS MONSTROSITY.

BY FRED. H. P. EDWARDS,
IOWA CITY, IOWA.

On Sunday, January 18, 1891, I was called to attend a small heifer, three years old, which had been in labor about four hours and which the owner had attempted to deliver, and was informed by owner that the animal had gone its full time.

I found the animal lying on its right side apparently dead, having exhausted itself in attempting to deliver its offspring. Vaginal examination disclosed both fore feet and one head well in passage; the passage was rhy, dry and swollen. The head presented was torn badly, the damage having been done during the attempts at extraction; with lubrication I succeeded in entering womb and discovered what at first I thought was another calf, but on further examination could not find any other forelegs and at once saw I had a monstrosity. I oiled the passage well and succeeded in securing good hold in poll of head, presented with hook, strapped each leg and began gentle traction, but making very little headway owing to the animal not helping at all, determined to use all the force we had; and, after a few good, steady pulls, succeeded in delivering the calf with the other head placed back on its withers.

The calf weighed eighty-six pounds, was dead and much bloated. Mother was lacerated some, but made a speedy recovery. Externally calf looked normal, except right front leg at knee resembled more a hock than anything else.

There were fourteen cervical vertebra, the seventh pair being joined one to another: from the seventh cervical to the seventh dorsal they were joined by their transverse processes; from there on by their bodies. The lumbar, sacral and coccygeal vertebrae were normal and single. The sternum was double and very abnormally broad. Ribs were normal, both in number and size.

The muscular system seemed healthy and in neck was double. The organs of digestion were perfectly developed and were double from mouth to stomach; from these on were single. There were two oesophagi which followed the usual course in neck and thoracic cavity, passed through same foramen in diaphragm, and entered rumen about two inches from each other. The liver was large and heavy.

The respiratory tract was double in cervical portion, there being two distinct tracheæ which had no connection whatever with one another, but entered the corresponding lung by a single trunk on its own side. The lungs were small and sank in water.

The urinary apparatus was single and well developed.

The heart was large, and normal. There were two anterior aortas and one posterior aorta. Each neck and head was well supplied with blood. The venous system was as well developed as the arterial, there being four jugulars, as well as the accessory jugulars, which were four in number and well developed.

The nervous system was perfect, the two brains being normal in size; the spinal cords were double up to about the seventh dorsal, where they joined and continued as one. The organs of sense were perfectly developed. The genital organs were normal, one testicle being in the scrotum and the other in the abdominal cavity.

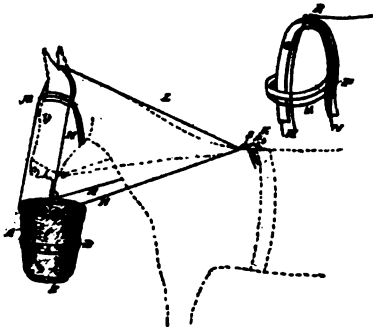
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month ending June, 1891.

458,718. NOSE-BAG. GEORGE D. LEONARD, New Haven, Conn.
Filed May 14, 1890. Serial No. 361,802. (No model.)



Claim.—1. The combination, with a nose-bag having pulleys at its upper edge, of a cord forming a loop over the head of the animal, extending down through the pulleys on the bag and back through slide or buckle S, secured to a hook at the back of the animal, and a separate cord extending from said buckle over the top of the animal's head to the bag, substantially as described.

2. The combination, with the nose-bag having loops, as described, of a cord forming a loop at the top of the head of the animal, extending down through the pulleys of the bag and back through slide or buckle S,

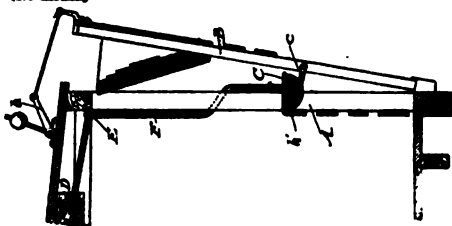
which is connected to the back hook, a halter or bridle having loops which embrace said cord at the sides and top of the head of the animal, and a cord extending from the bag and loop at the top of the head through slide S, substantially as described

Claim.—1. The combination, with a stock-car, of the elevated water-pipe E, arranged at the roof portion of the car and provided with depending branches F, extended down inside the car and bent laterally to the outside or front thereof, the rotating troughs C, and short pipes g, supporting the troughs and connected with the lower extremities of the said depending branches, substantially as described.

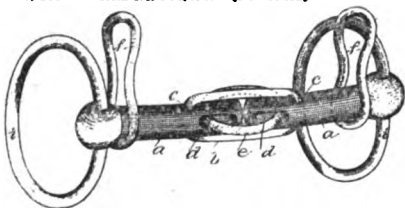
2. The combination, in a stock-car, of the fixed frame A, the elevated water-pipe E, having depending branches F, provided with short pipes g, the rotating troughs C, supported by the short pipes, the swinging false side B, hinged at its lower portion, and direct-acting link-bars c, pivotally connected to the rotating troughs and to the swinging false side, substantially as described.

3. The combination, with a stock-car having the fixed frame A and swinging false side B, hinged at its lower portion, of the elevated water-pipe E, arranged at the roof portion of the car and having depending branches F, extending downward inside the car and bent laterally through the fixed frame to the outside or front thereof, the rotating troughs C, the short pipes g, supporting the troughs and connected with the said depending branches, and the link-bars c, pivotally connected to the troughs and to the swinging false side, substantially as described.

458,804. WATERING DEVICE FOR STOCK-CARS. **SHERRARD M. FISHER,** Chicago, Ill. Filed Dec. 12, 1890. Serial No. 374,632. (No model.)



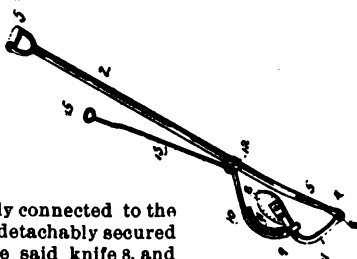
458,414. BRIDLE-BIT. **JOSEPH McKENNEY,** Chelsea, Mass. Filed Mar. 8, 1891. Serial No. 384,236. (No model.)



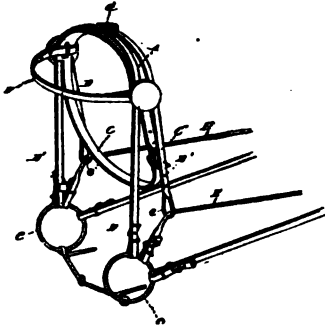
Claim.—The herein-described snaffle or bridle bit, consisting of two bars, the inner ends of which meet or nearly meet, said bars being joined together by means of a link connected therewith at an appreciable distance beyond the meeting ends, the inner portions of the bars being slotted, and a ring e, arranged in the said slots at a right angle to the said link, as set forth.

Claim.—The combination, in a device of the class described of a long pole-handle 2 and curved lever pivotally connected with said handle and provided with the convex knife 8, detachably secured to the end of said lever at one side thereof, a ring 12, arranged to slide upon the pole 2, the curved lever 10, secured to said ring and pivotally connected to the lever 7 at 9, the concave knife 11, detachably secured to one side of the lever 10 opposite said knife 8, and the rod 13, secured to the ring 12 and provided with a handle 15 at its end, all substantially as described.

458,675. DEHORNING IMPLEMENT. **THOMAS W. SPRAGUE,** Minneapolis, Minn. Filed Jan. 12, 1891. Serial No. 377,409. (No model.)



458,948. BRIDLE. HENRY SCHMITZ, Wynnew, Mebr. Filed Jan. 26, 1891. Serial No. 572,111. (No model.)



Claim.—1. The bridle having its side or cheek straps each passed up and over the top of the head-piece, crossing each other thereat, passed through an anti-friction loop, and terminating each on the opposite side of the bridle in a loop or eye, substantially as specified.

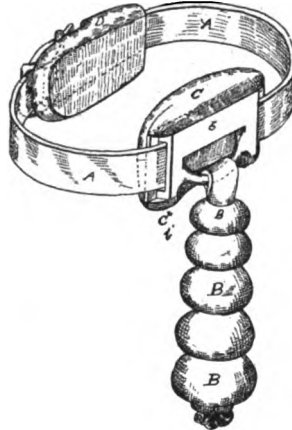
2. In a bridle, the combination with the head, throat, and brow- straps, the bit, and their connections, of the side or cheek straps connected at one end to the bit-rings and passed up through loops over the head-piece, crossing each other at the central top portion of said head-piece, passed through a

loop thereon, thence extended down on opposite sides of the bridle, and terminating each in a loop for the bridle-rein, substantially as specified.

3. In a bridle, the combination, with the cheek or side straps, each passed up and through a double roller-loop at the top of the head-piece, thence respectively extended down the opposite sides of the bridle and terminating each in a loop or eye, of the bridle-reins connected to the bit and passed through said loops or eyes and having a connection with the reins, substantially as specified.

Claim.—The improved article of manufacture comprising the strap and buckle, the rubber loop-pad in the rear of the buckle and adjustable on the strap, and the adjustable pad C, having loop *c* and plate *b*, secured in said loop and carrying the pendant, all substantially as shown and described, and for the purposes specified.

54,210. RUBBER PAD FOR INTERFERING-STRAPS. MICHAEL HADGNEY, St. Louis, Mo. Filed Dec. 29, 1890. Serial No. 376,015. (No model.)



458,719. NOSE-BAG. GEORGE D. LEONARD, New Haven, Conn. Filed May 23, 1890. Serial No. 352,868. (No model.)

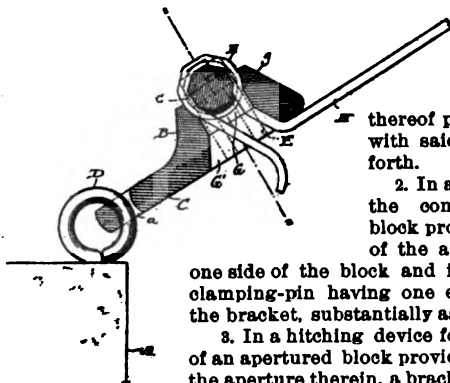


Claim.—1. A nose-bag body consisting of a tube, of canvas or similar flexible material, having a hem or distending-piece at its lower edge, in combination with a bottom of rigid material having a

rabbet at its lower corner, into which the corded edge of the body extends, substantially as described.

2. The combination, with a tubular bag-body having a hem at its lower edge, and a cord inclosed therein, of a wooden bottom rabbetted at the lower corner, so that the corded canvas lies in the rabbet, and securing means for holding the bottom into the bag, substantially as described.

458,880. HITCHING DEVICE FOR ANIMALS. ALFRED DAPHNIAH, Hurley, Wis., assignor of one-half to Alexandre Lakod, same place. Filed Dec. 22, 1890. Serial No. 375,484. (No model.)



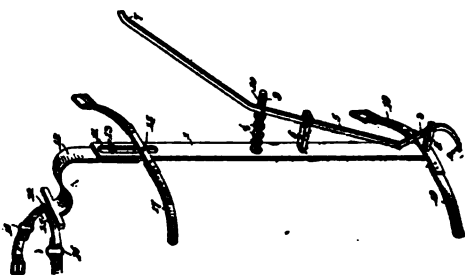
Claim.—1. In a hitching device for animals, the combination of an apertured block provided with a seat at one end of the aperture therein and a clamping-pin having one extremity thereof pivoted to the block in line with said seat, substantially as set forth.

2. In a hitching device for animals, the combination of an apertured block provided with a seat at one end of the aperture therein, a bracket at one side of the block and in line with said seat, and a clamping-pin having one extremity thereof pivoted to the bracket, substantially as set forth.

3. In a hitching device for animals, the combination of an apertured block provided with a seat transverse to the aperture therein, a bracket on one side of said block, and a clamping-pin pivoted to said bracket and having the central portion thereof reduced in diameter and polygonal in form, substantially as set forth.

Claim.—1. An animal-poke comprising the plate or bar designed to be secured to the head of an animal, the barb-lever fulcrumed at the outer end of the bar or plate and arranged to engage the nose of an animal, and the operating-lever connected with the barb-lever and arranged to be depressed to force the barb-lever into the nose of an animal, substantially as described.

458,197. ANIMAL-POKE. WILLIAM F. MARQUET, Marquette, Mo. Filed Feb. 20, 1891. Serial No. 382,190. (No model.)



2. An animal-poke comprising a plate or bar designed to be secured to the head of an animal, the barb-lever fulcrumed at the outer end of the bar or plate and arranged to engage the nose of an animal, the operating-lever fulcrumed intermediate its ends and arranged at an angle to the plate or bar and having one end connected to the barb-lever, and the spring interposed between the operating-lever and the plate or bar, substantially as described.

3. In an animal-poke, the combination of the plate or bar provided with fulcrum-posts 2 and 6, the barb-lever mounted on the post 2, the operating-lever fulcrumed on the post 6 and connected to the barb-lever, the rod secured to the plate or bar and provided with a longitudinal slot to receive the operating-lever, and the spring arranged on the rod and interposed between the operating-lever and the plate or bar, substantially as described.

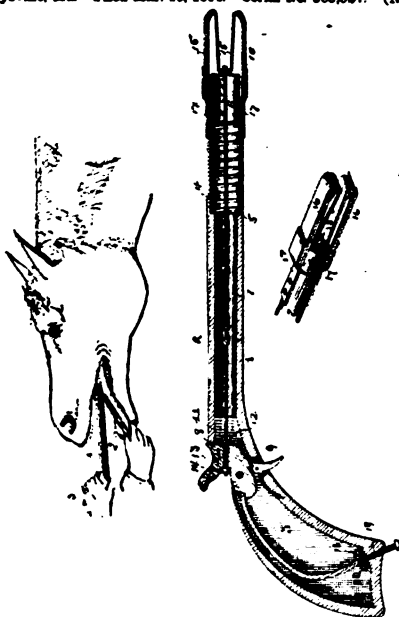
4. In an animal-poke, the combination of the plate or bar provided at its inner end with the longitudinal slot 11, the barb-lever arranged at the outer ends of the plate or bar, the operating-lever connected to the barb-lever, the strap 19, arranged at the outer end of the lever, the extension 12, adapted to be adjusted and provided with a set-screw arranged in the slot 11, and the strap or band 17, substantially as described.

453,508. VETERINARY INSTRUMENT. JOSEPH RUBY, Beck-
leysville, Md. Filed Mar. 18, 1891. Serial No. 335,527. (No model.)

Claim.—1. A veteri-

nary instrument comprising the pistol, the plunger arranged within the barrel, the rod connecting the plunger and the hammer, the curved arms arranged at the end of the barrel and the elastic piece 15, centrally secured to the plunger and having its ends connected to the arms, substantially as described.

2. A veterinary instrument comprising the pistol having its barrel provided with the shoulder 5, the spiral spring arranged within the barrel and having its inner end bearing against the shoulder, the plunger arranged within the barrel and being engaged with the outer end of the spring, the rod connecting the plunger and the hammer, and the spring-arms secured to the outer end of the barrel and adapted to hold medicine, substantially as described.



3. In a veterinary instrument, the combination of the pistol, the screw 20, arranged at the butt of the pistol, and the metal block provided with a recess to receive the rear end of the mainspring and secured to the screw, substantially as described.

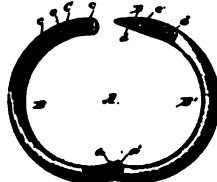
3. In a veterinary instrument, the combination of the pistol, the screw 20, arranged at the butt of the pistols, and the metal block provided with a recess to receive the rear end of the mainspring and secured to the screw, substantially as described.

4. The barrel and the plunger therein, combined with the elastic piece 15, centrally secured to the plunger, the curved spring-arms 16, to which the ends of the elastic piece are secured, and the springs 17, attached to the barrel and connected to the ends of the arms 16, substantially as described.

5. The barrel and the plunger therein, combined with the elastic piece 15, centrally secured to the plunger, and the curved spring-arms 16, said arms being composed of plates of sheet metal which are flexibly connected to the barrel, substantially as described.

Claim.—A nose-ring 453,940. ROSE-RING FOR ANIMALS. EDWARD K. REA, OVID, Mo.
consisting of two hinged Filed Sept. 1, 1890. Serial No. 363,644. (No model.)

sections, one of the said sections having a slot in the outer side of its free end, the end of the said slot being beveled and the opposite section having its free end beveled from its inner face to circumference and being reduced in thickness, forming a tongue, the base of the said tongue being beveled outward toward the sides, and a pin passing through the walls of the said slot and through the body of the said tongue, as described.



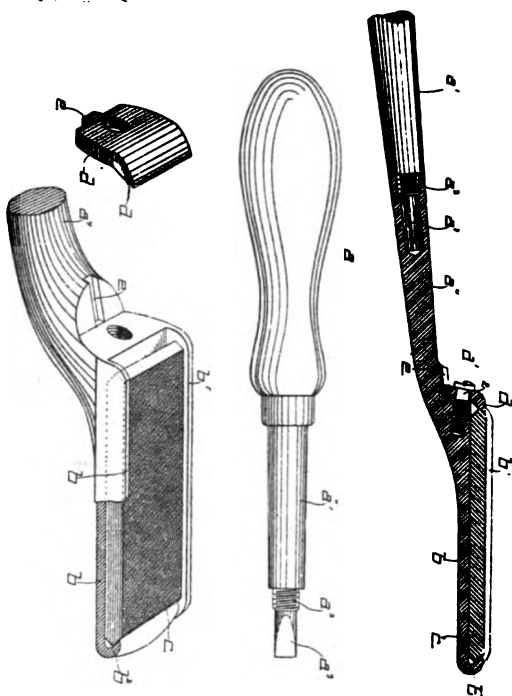
Claim.—1. In a horse tooth-file, the handle and shank or equivalent, the base *b*, having the lip at its outer end, and vertical lips, as *b1*, at each side to receive and hold the file, combined with a removable locking device at the heel end of the file, consisting of a plate of suitable width to enter between and be guided by said vertical lips *b1*, substantially as described.

2. In a horse tooth-file, the handle and shank or equivalent, and the base *b*, having the guideway *c*, combined with the file, the intumed lip *b2* at one end, and the locking device *d1* at the other end, having the projection *e1* following in said guideway, substantially as described.

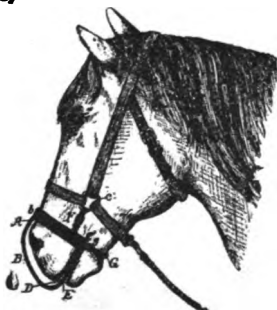
3. In a horse tooth-file, the handle and shank or equivalent, and the base *b*, combined with the file beveled at its ends, the intumed lip *b2* at one end, and the removable locking device *d1* at the other end, substantially as described.

4. In a horse tooth-file, the file and holder for it and the locking device for said file, combined with a two-part shank *a1 a4*, and a screw-threaded screw-driver socket in the portion *a4*, substantially as described.

454,486. VETERINARY FILE. FRANK K. HENNE, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed Jan. 17, 1891. Serial No. 378,064. (No model.)



458,982. ANTI-CRIB-BITING DEVICE FOR HORSES. ANTHONY LYON, Philadelphia, Pa. Filed Mar. 11, 1891. Serial No. 384,553. (No model.)



Claim.—1. A device for preventing an animal from crib-biting, said device having a tongue projecting into the mouth of the animal between the teeth of the upper and lower jaws, substantially as described.

2. The combination of a band extending around the nose of the horse and into the mouth of the rear, with a band extending over the nose between the nostrils and into the front of the mouth between the front teeth and attached to the rear band at the back of the mouth, substantially as described.

3. The combination of the rear band with the front band B, attached to the rear band A at its ends, and a plate on the front band in line with the front teeth when the device is applied to the mouth of the animal, substantially as described.

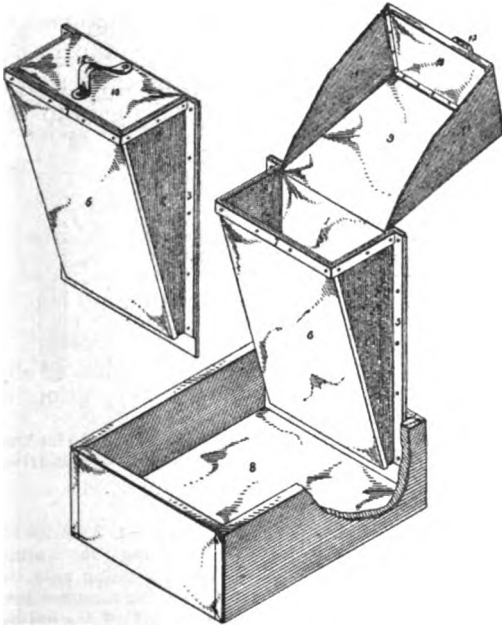
4. The combination of the rear band and the front band, both extending into the mouth of the horse, straps by which the device is secured to the halter, and a strap passing under the lower jaw of the animal, substantially as described.

5. The combination of the rear band, the front band, devices for securing the bands to the halter, and plates on each side of the front band and in line with the front teeth of the animal, substantially as specified.

6. The combination of the front and rear bands secured together, with plates on each side of the front band in line with the teeth of the horse, and a tongue-piece below the band, substantially as described.

7. The combination of the front and rear bands, the straps for securing the bands to the harness, with filling-pieces for increasing the thickness of the front band at the point where it crosses the line of the front teeth of the horse, so as to open or close the mouth more or less, substantially as described.

453,817. REGULATOR FOR FEED-BOXES. JOSEPH S. MILLA,
Union, Ill. Filed Jan. 29, 1891. Serial No. 379,514. (No model.)

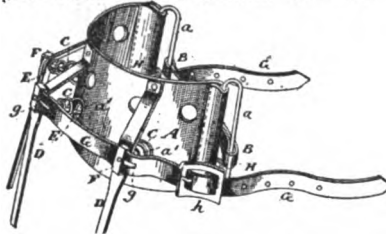


Claim.—1. A feed-regulator for horse feed-boxes, consisting of a receptacle having a contracted lower end, a flexible front, and rigid sides, said front portion secured at its edges to the sides.

2. A feed-regulator for horse feed-boxes, consisting of a receptacle having a contracted lower end, a scoop tapering to the forward end, the height and taper of the sides of said scoop being such as to limit the distance it may extend into the feed-receptacle.

Claim.—The fingers D, having outside keepers F, strap G, passing through said keepers and fastened thereto and to the fingers, the straps H H, and the apertured nose strap A, having end loops connected by a buckle-strap B, all combined with prickers E on the under side of fingers D and surrounded by spiral springs, whereby the device may be applied to the nose of an animal, as and for the purpose described.

453,359. NOSE-BAND FOR ANIMALS. JOHN W. KRA, Shreveport, La. Filed Oct. 4, 1890. Serial No. 367,052. (No model.)



EDITORIAL DEPARTMENT.

DR. C. B. MICHENER.

We congratulate the Bureau of Animal Industry and Dr. C. B. Michener, on their mutual choice and acceptance, in the latter's appointment, as Assistant Chief of the Bureau of Animal Industry.

Dr. Michener has been well known as a New York practitioner, as Professor of the American Veterinary College, as Professor of the New York College of Veterinary Surgeons, and as an employee of the Bureau of Animal Industry, stationed in New York. His departure from New York will be a personal loss to his many friends, but his assuming charge of the business portion of the Bureau of Animal Industry, will be a gain to the government and, we trust, agreeable to himself.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The members of the U. S. V. Medical Association are hereby notified that the Trunk Line Association—Southern Pass Association have granted the usual one and one-third rates to all members of the profession attending the annual convention at Washington, September 15th to 17th, 1891.

This promises to be one of the most important and interesting meetings ever held by the association. The reports of the Committees on Food Inspection and Diseases will be given a more thorough hearing and discussion at this meeting than has been accorded them for many years. The relation of these subjects to the living world at this time in our nation's history and to sanitary science the world over, commands the presence of every member of the association, and a generous welcome will be accorded to every member of the profession who may attend.

Dr. C. C. Lyford, of Minnesota, will read a paper on the subject of "Barren Mares," a topic of interest to all. Dr. A. H. Baker, of Chicago, will read a paper. Other papers of much general interest are promised for this meeting, which will afford all an opportunity of being interested and add to the more thorough amalgamation of the profession of our entire country, so auspiciously begun at Chicago.

W. HORACE HOBKINS, *Secretary*.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

It has been decided by the officers of the New York State Veterinary Medical Society to postpone the holding of the semi-annual meeting of the society until Wednesday morning, August 12, 1891, at nine o'clock. It has also been decided to hold the meeting in New York city to accommodate the members from the eastern part of the state and to comply with the requests of several veterinarians of New York and Brooklyn who are taking considerable interest in matters pertaining to Veterinary Legislation, an article on which was published in the June number of this JOURNAL.

TUBERCULOSIS.

The following paragraph was omitted from Dr. Lee's article on the "Prevalence of Tuberculosis" in the June number of the JOURNAL, coming after the paragraph beginning "The use of Koch's lymph," etc.

* * * * *

I had two cows at the Harvard Veterinary Hospital, through the courtesy of Dr. Lyman, on which to try the action of Koch's lymph, which Dr. Stone, of Boston, was going to procure directly from Dr. Koch.

One of these cows died and the other was killed before the arrival of the lymph.

Dr. Stone thought so little of its value as a diagnostic agent, from experiments on people, that when the lymph finally did arrive he did not think it worth while for me to get any other cases for experiment.

TUBERCULAR ORCHITIS IN A BOAR.

M. S. MAYO, M. S., D. V. S.
MANHATTAN, KANSAS.

About the 15th of May, Dr. Orr left at my laboratory the testicle of a full-blooded Berkshire boar which had the appearance of being tuberculous, a microscopic examination confirming the diagnosis. Tuberculosis among swine is quite rare. Among 30,922 slaughtered at Augsburg, only three were affected.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEONARD PEARSON, B. S., V. M. D.

CANTHARIDES.

Army Veterinarian Tetzner reports, in the June number of the *Zeitschrift für Veterinärkunde*, an experiment in which he studied the action of cantharides in a case of chronic laryngitis in a horse. It is well known that Prof. Liebreich, of Berlin, has recommended the subcutaneous use of a compound of cantharides (cantharidate of potash) in the treatment of Tuberculosis, and that this remedy has been used, with reported good results, in cases of laryngeal tuberculosis and chronic laryngitis in man.

The author had under observation a half-blood saddle mare, 10 years old, that had been affected with a severe cough for two years. The cough was especially violent in dusty places and when the mare was being ridden; it was so bad at all times as to cause the rider great annoyance, from the fact that the head and neck were carried extended, and constant efforts were made by the mare to relieve herself of the restraint of the bit. Every remedy that promised results had been tried, and had failed to produce, at most, more than a temporary improvement in the symptoms. Even the treatment advised by Prof. Dieckerhoff in this class of cases—intratracheal injections of solutions of tannine, Lugol's solution, and nitrate of silver—was of no avail.

Encouraged by the results that some clinicians had claimed for the Liebreich treatment, Tetzner decided to try the remedy. He administered, in pill form, .25 gm. (gr. iv.) per day, for two days; then double this dose for two days. No medicine was given for the next two days and then the treatment was recommended where left off. In this it was arranged that periods of treatment and non-treatment, each of two or three days should alternate for some two weeks. Except the first doses, all contained 0.5 grms. ($7\frac{1}{2}$ grs.)

During the treatment the urine was examined several times and no changes discovered. The mare's appetite improved, the coat became shiny, and the temperament more lively. At the same time the cough diminished in frequency and intensity until,

during a ride of one to two hours, but one or two coughs could be noticed, and these were not of the distressing nature that previously characterized them. This favorable state of affairs lasted some twenty days, after the cessation of the treatment, when the mare commenced to cough again if ridden in the dust. But the improvement is still very marked and encouraging. The author closes by saying, that only future observation can determine if the disease will resume its previous form, but thinks his results should encourage other experiments in the same direction.

ECZEMA.

The following salve is recommended for eczema and parasitic diseases of the skin :

R	Acid. salicy.	5.0 grms.
	Creosot,	2.0 "
	Sapo. medicat.,	100.0 "

M.

Zeit. f. Veterinärkunde, III., 3.

LOCAL ANÆSTHESIA.

The following mixture is said to be very effective in producing local anæsthesia :

R	Chloroform,	10.0 grms.
	Ether,	15.0 "
	Menthol,	1.0 "

M.

The skin is to be moistened with this fluid and kept moist, for one minute before the operation.

Ibid.

About 100,000 lbs. of bacon which was said to be from Holland, but which was supposed by the authorities to be from America, has recently been seized in Cologne and Diesseldorf, and veterinarians engaged in meat inspection, in various parts of Germany, have been called upon to give their opinion as to the origin of this pork. That the meat came from Holland is undoubted, but the authorities claim that it was imported into this country from America. In Cologne it has been decided that the bacon is from America and it will be destroyed. The experts claim to be able to diagnose our pork by the following characters: the sides are covered with black hair (in Germany and Holland

most of the hogs are white); the meat has a peculiar odor of turpentine which is especially noticeable in the cooking, and this odor clings to the hands and instruments for days; the taste is rancid, the water in which it is cooked foams more than is usual and the meat contracts on the bone more than the native variety does. It is said that five to ten per cent. of these sides contained trichinæ. Samples of pork from America, procured through the German Consul showed the same characters.—*Zeit. f. fleisch u. Milchhyg.*, No. 9, '91.

GARGET.

Prof. Kitt, of Munich, has found a bacillus that is constantly present in the udder in cases of mastitis (parenchymatous inflammation of the udder), and pure cultures of which injected into the milk cistern will cause the disease. The author also made experiments of injecting the bacillus of malignant œdema, *oidum lactis*, *micrococcus tetragenous*, and culture of soor into the milk cistern, but these produced no inflammation. The bacillus of blue milk and of chicken cholera produced a catarrhal mastitis. The specific bacillus of mastitis (the mastitis bacillus), when rejected, produced, in every case, a severe purulent, indurative mastitis, and even smearing the cultures about the mouth of the teat was sufficient to cause the disease. The inflammation was always confined to the inoculated quarter, and one attack did not give future immunity. Injections, into the udder, of solutions of creoline and iodine had no curative effect.—*Monatsh. f. prat. Thierheilk. II. Bd.*, H. 1.

HYPOSULPHITE OF SODA.

By J. W. MARSH, D. V. S.

My attention was attracted to the article by E. N. Sheppard, in the March number of *THE JOURNAL*, in regard to the use of Hyposulphite of Soda.

I find it a most valuable remedy in all my cases of Azoturia, since I have commenced to use it. Under the old line of treatment, in cases where my patient was prostrated and showed great restlessness, my prognosis was generally unfavorable. Since I have employed the Hyposulphite the greater number have made a recovery and I most heartily recommend its use in these cases.

SOCIETY PROCEEDINGS.

The Connecticut Veterinary Medical Association.—The annual meeting of the Connecticut Veterinary Medical Association was held at the Scovill House, Waterbury, on Tuesday June 2, 1891, at 8 o'clock in the evening.

The members present were E. R. Storrs, Chas. H. Smith, H. Whitney, N. Tibbals, Robt. Todd and Thomas Bland. Geo. B. Towne, D.V.S., and Mr. J. Schofield, a veterinary student, were also present.

The president, Dr. Bridges, not being present, Dr. Chas. H. Smith, Second Vice-President, took the chair.

Dr. E. R. Storrs proposed Dr. Geo. B. Towne for membership.

The following officers were elected for the ensuing year: Thomas Bland, President; Chas. H. Smith, First Vice-President; Harrison Whitney, Second Vice-President; Robt. Todd, Secretary; Nathan Tibbals, Treasurer. Board of Censors: E. C. Ross, Geo. Bridges, E. R. Storrs, Harrison Whitney and Nathan Tibbals.

The retiring President, Dr. Geo. Bridges, not being present on account of poor health, his address of greeting was read by the Secretary, as follows:

GENTLEMEN:

It gives me great pleasure to greet you at this, the close of another year. I congratulate you on the success of our Association; little by little, step by step we have increased our membership, we have become influential outside of the profession as well as in it, commanding the respect of the public and official bodies of the State until the Connecticut Veterinary Medical Association has grown from its infancy, and passed through the struggles of its first years, through the combined efforts of a determined few who saw its needs and usefulness in the future, and who—let me add—have stood fast to the helm ever since, and now we have a regularly chartered and incorporated association composed of a body of men who are determined to still farther advance the profession in our State, and at the same time are ever ready to protect stock-owners from losses through contagious and infectious diseases, and only ask the confidence of the public that they may also be the means of protecting the human family from the transmission of such diseases from animals to man.

There have been many very interesting papers read and much benefit derived from their discussion. Interesting and instructive cases have been freely quoted by all. Much has been accomplished, and last, but by no means least, the tie of fraternal fellowship has been still further strengthened and it is the earnest wish of your humble servant that nothing will ever disturb it.

We may have our little differences outside, but no matter, let us go on in the future as we have during the past.

Our financial standing is good and we are everyway in a flourishing condition. We have a Committee on Contagious and Infectious diseases who have accomplished good work during the past winter.

No doubt you have all read their report as published by the State Board of Health. It is a correct version of the condition existing in our State on such diseases and a step in the right direction. The committee are to be congratulated on this good work, and I know they have the thanks of every member of this profession at home and abroad, not speaking of the thanks due them from the many loving mothers and fathers who are many times innocently using milk from diseased cows. If you have not done so I would suggest that the report be struck off in pamphlet form and well distributed throughout the State.

I hope this committee will be continued, and if the political muddle ever clears up let them draft a good strong Bill.

If on tuberculosis I am in favor of inspection of all herds of dairy cattle; compelling the farmers to report all cases in their herds accompanied by a certificate of his attending veterinarian. Any neglect on his part to carry out the law to be amenable to punishment.

I would have a fine imposed on any veterinarian who refused to grant such certificate or failed to report any contagious disease of whatever nature brought to his notice. The question of indemnity to owners of diseased stock has often been discussed in different States, and it seems to be the opinion of many that a glandered horse is not worth anything anyway. I do not think that should be so. Why should a glandered horse be a dead loss in a State where this loathsome disease has been allowed to run rife for many years? In my opinion if this State would pay something, no matter how small, that in one year or two at the outside, with proper laws and proper enforcement, the disease would be entirely stamped out.

Before concluding, I would like to call your attention to one thing we have neglected in the past year. We have not performed our duty towards our American Veterinary JOURNALS. These journals must have support to live and material for publication. I would suggest that we give regularly papers that are read and those of the cases quoted. I do not think it a good plan to crowd their pages with every detail of these meetings, but as much as in the Secretary's judgment would be interesting to the profession. I know that I find much food for thought in the reports of other associations and I think it no more than right that we, too, should contribute our share.

In conclusion I wish to thank you for the great honor you conferred upon me in the past two years. As I look back on the time now passed away I cannot but think of it with pleasure. At each meeting every member carried himself with decorum becoming a gentleman.

I take this opportunity to thank our faithful Secretary for his courtesy towards me on all questions and at all times, and if I have in any way offended him by alluding to the above, I wish to assure him that if I were his judge I would certainly acquit him.

I am Yours Fraternally,

GEO. BRIDGES, D. V. S.

The next meeting will be held in New Haven, on Tuesday, September 1, 1891, at which time Messrs. Bland and Todd will read papers.

R. S. TODD, *Secretary.*

Massachusetts Veterinary Association.—The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, May 27, 1891.

President L. H. Howard in the chair. Members present : Drs. Billings, Blackwood, Emerson, Hadcock, Hitchings, Howard, Lee, Skally, Winchester, Winslow, and the Secretary. Honorary member, Dr. Stickney. Visitors : Dr. F. M. Perry and Mr. Andrew Ward.

The minutes of the previous meeting were read and accepted.

Unfinished business : The Secretary was instructed to look up the attendance of members during the past year, in order to decide who is to receive the rasp offered as a prize by Dr. Lee, for the best attendance. New business : Dr. Winchester suggests that the by-law requiring a thesis from candidates for membership be rendered inoperative for three months. It was found that in order to do this the Constitution would have to be amended. Dr. Winchester thereupon withdraws his suggestion. Motion made by Dr. Winchester that the Secretary notify all veterinary graduates in Massachusetts of the existence of the Association and invite them to join. Seconded by Dr. Winslow. Carried. Moved by Dr. Winchester, that two hundred copies of the Constitution be printed. Seconded by Dr. Winslow, and carried.

Papers and discussions : Dr. Billings was called upon by the President to address the Association. Dr. Billings delivered an address, a synopsis of which is given, as follows :

He prefaced his remarks by saying that he felt he was among his friends, and that he would have renounced his title of veterinarian long ago if it were not for the fact that he was a member of the Massachusetts Veterinary Association. He then spoke briefly of Clark University, at Worcester, and said that some of his friends there would be happy to make a scientific investigation of the spinal cord of the horse which Dr. Howard had sent to Ward's Wharf, for the members of the Association to examine, the animal having an exaggerated form of stringhalt.

He then proceeded with the main topic of his discourse, saying that the Massachusetts Veterinary Association must do all in its power to push the profession forward in this State. If we put our shoulders to the wheel, he thinks we can accomplish a great deal for the advancement of our profession. One way to do this was to secure provision from the next Legislature to appoint a scientific veterinarian, at the State Experiment Station, at Amherst, for the investigation of the infectious animal diseases. He thought that the State ought to be willing to appropriate \$15,000 for this work. What we want to do is to start this work at Amherst and show the people that the veterinary profession amounts to something. In Massachusetts we may not have exactly the same conditions as in the West, but we have work here to do, if we can only get a start, and make a centre at Amherst, with the profession back of it. If we only had a place in Massachusetts where we could refer our doubtful pathological questions, it would help to advance our profession more than anything else. What we want is to have our profession send in a strong petition to the Legislature to get a place established, a place where we can put our best man, and out of which good pathological work can come.

After Dr. Billings closed his remarks, the following discussion ensued :

Dr. Lee thought that one way to form a veterinary centre might be to raise funds to pay the expenses of a farm, to which we might send our unusual surgical cases, or surgical cases which the owners did not care to see through to the end; the members of the Association to send the cases and render their services free.

Dr. Winchester thought that Dr. Billings had struck the right keynote in speaking of Amherst. He also referred to Dr. Goessmann's work on feeding experiments with animals, and said he had obtained results that would astonish the world when he was ready to publish them. Dr. Page is a good man, although without the special training required by a scientist. Dr. Humphrey is a good microscopist, and with such a chemist as Dr. Goessmann, and with the buildings already built, there is a valuable nucleus ready for immediate work.

The President said that Dr. Billings had warmed us up on a new tack, but that we are not very good as politicians to get such work done. As an illustration of how useful a veterinary department at the Experiment Station at Amherst would be to the profession, and to owners of animals, Dr. Winchester cited an incident in his own practice. A farmer lost several cattle, and was afraid that he had some contagious disease among them, or that some malicious person was poisoning them. Dr. Winchester sent some of the viscera from animals which had died to Prof. Goessmann, who found that the trouble was due to acetic poisoning as a result of feeding too much ensilage. The food was changed, and the survivors recovered.

Dr. Billings mentioned a disease in horses, fed upon ensilage, resembling cerebo-spinal meningitis, which was undoubtedly due to some germ formed during the fermentation of the food.

Dr. Peters asked Dr. Billings if he thought Clark University would establish a department for the investigation of infectious animal diseases, in case we failed to secure anything at Amherst. Dr. Billings thought that Clark University is a great thing, and said that Dr. Hall is willing to do anything he can to help him, but that he favored Amherst *as the place*.

Dr. Stickney thought that the work done at Amherst in feeding animals, and vegetable physiology, was about the only systematic work of any importance done in this country, with the exception, perhaps, of a little work on rabies and tuberculosis, which had been done at the Harvard Medical School.

The conversation then turned to a discussion of Dr. Howard's case of stringhalt at Ward's Wharf.

D. Winchester made the motion that the Secretary be instructed to write to Clark University, asking if they would like Dr. Howard's stringhalt case for purposes of autopsy, and if they would that they be furnished with the result of both microscopic and macroscopic examination, and that the bones of the hind legs from the tibias down be returned to the Association.

Seconded by Dr. Winslow. Carried.

Dr. Winchester spoke of a case in his practice at Lawrence, of a dog bitten by another one last July, which showed no evidences of rabies until the other day. Dog upon post-mortem, by Dr. Winchester, was found to

have foreign bodies in stomach, stomach congested, brain congested, and effusion in the ventricles. He had bitten other dogs. Query: Will they go ten months before showing symptoms? Dr. Winchester then spoke of a dog which had not been in contact with other dogs for twelve months. He showed rabiform symptoms, and was poisoned by him. On post-mortem the stomach showed erosions; brain not examined. Diagnosis in this case, gastritis.

Dr. Lee reported a case of hernia in a grey gelding. The animal was a young one which the owner had just bought, and the first night he was brought home kicked over the partition of the stall, the near hind leg hanging over the partition. After freeing him the owner found he had a large swelling above the left flank, but did not attach much importance to it. He did not seek professional advice, but took the opinion of a friend, who told him it would be a "gathering" and to wait a few days until it "softened," and then to "stick a knife in it." After a few days the owner "stuck a knife in it," and as nearly as Dr. Lee could find out a little blood-stained serum ran out. Later in the day the horse was taken with colicky pains, and Dr. Lee was sent for. He found a loop of intestine protruding from the opening made by the knife, and already becoming gangrenous. After getting Dr. Peters to see the case in consultation, it was decided that the only thing to do was to destroy the animal. Upon post-mortem a rent six inches long was found in the muscular coat of the abdomen, in the upper part of the flank, the peritoneum and intestines being retained by the skin and subcutaneous connective tissue. The animal had been regularly worked for a week or ten days after receiving the injury up to the day the owner had opened the swelling. The loop of protruding intestine was the size of a man's fist, strangulated at the opening in the skin, and had commenced to mortify.

Dr. Lee also reported a case of a horse that had had trouble with his teeth for four years. About three years ago the first upper molar tooth had been pulled out; and the animal's mouth afterward neglected, the unopposed lower molar grew until it had worn a hole in the palate, exposing the lower ends of the turbinated bones and causing them to ulcerate. There was a disagreeable-smelling discharge from the nostril and the horse made a roaring sound when put to any exertion. Dr. Lee removed the overgrown first lower molar, and knocked out two pieces of the root of the upper molar which remained, leaving a hole as large as a half dollar in the floor of the nostril. This hole had to be plugged with oakum when the horse drank, as if left open it prevented his making a vacuum with his mouth, and hence he could not drink. The hole is now closing rapidly with healthy granulation tissue. There are healthy granulations of the ends of the ulcerated turbinated bones, the discharge is ceasing, and has lost its disagreeable odor, and the horse now feeds easily, and is rapidly gaining in flesh and strength.

Dr. Winchester reported a case of fracture of the pubic symphysis in a mare which was trying to foal. She was standing upon a wet floor when her hind feet flew out sidewise, and the ischio-pubic symphysis split its entire length.

Dr. Winslow said he had a case of ulceration of the palate similar to the one reported by Dr. Lee.

Dr. Blackwood reported a case of rupture of the uterus of a mare used on the horse cars. She was in foal, and last winter fell down and the car ran on to her. She did not seem much hurt at the time, and was soon able to resume work again. One night this spring he was sent for in a hurry to see the mare, as she was trying to foal, and evidently required assistance. When he arrived, the mare was dead, and a quantity of large intestines protruded from the vagina. Upon post-mortem examination he found a rent at the neck of the uterus through which the intestines escaped, and a fully-developed foal in the uterus. The edges of the rent were fully cicatrized, showing the tear to be an old one, and in all probability the result of the fall last winter.

Dr. Howard said that Mr. Ward must often have interesting experiences, and called upon him for a few remarks.

Mr. Ward related a case that might have been mistaken for rabies by members of the laity, which occurred in one of his hounds. The dog acted strangely one morning when he came down stairs, snapped at him and the maid when they went to touch him and acted in a very unusual manner. He told his man he was afraid the dog was going mad, and to chain him securely in the stable until his return that evening. He then set out for his place of business, but had not gone far when he met a neighbor who told him that one of his hounds had been smelling around one of his (the neighbor's) bee hives that morning and had been pretty thoroughly stung. Mr. Ward said that the case of rabies was at once accounted for, and he told the man to unchain the dog as soon as he returned home, and the dog was perfectly well up to the present time. He thought that many cases of so-called rabies could often be accounted for in a similar way. Mr. Ward also kindly offered to keep the pony with stringhalt at his wharf as long as the Association wished it to remain there.

Dr. Winchester reported a case of fistula of Stenos' duct in a horse.

Dr. Winchester moved that the Association extend a vote of thanks to Mr. Ward for his courtesy and kindness in keeping the horse with stringhalt at his wharf for our observation.

Seconded by Dr. Stickney. Carried unanimously.

Meeting then adjourned.

AUSTIN PETERS.
Secretary.

VETERINARY COLLEGE NOTES.

The Lahore Veterinary College.—Sir James Lyall distributed the prizes and diplomas at the Lahore Veterinary College on Wednesday May 6th; assisting by their presence were many officers of the army, and magistrates of Lahore.

The Principal (Mr. Nunn) read the following address :—

In the first place I have to thank you in the name of the students and teachers of the College for your presence, and for myself it is extremely gratifying in this the first year that I have been Principal of the Lahore

Veterinary College, to see that the interest taken in the institution has not fallen off, as is proved by your attendance here to-day

I must apologize for the makeshift accommodation I have to place at your disposal, as the building you now are in is only the side used for examining horses, but I trust that such of you as next year will honor us with your presence; will be received in a more suitable manner in the new lecture theatre which will, I trust, be finished before the coming winter-session. Nevertheless, when I contrast the appearance of the College to-day with what it was when I first became connected with it in 1882—when it was only a collection of a few grass huts—I cannot help admiring the energy and perseverance of my predecessor, George Kettlewell, Esq., who now holds the appointment of Inspecting Veterinary Surgeon to the Madras Army, and to whom is due the credit of the present popularity and efficiency of this institution. That the Veterinary College is popular amongst the inhabitants of Lahore can be seen by the hospital books, which show that 352 horses have been treated this year against 336 last, an increase of 16, and in the out-patient department 471 against 387 last year, or an increase of 84.

The cattle practice has developed largely, 517 patients against 431 last year, or an increase of 85. Both this and the number of in-door equine patients would have been much larger, only for nearly three months at the busiest time of the year, the cattle hospital, consisting of twelve boxes, which is also used for free equine patients, was in the hands of the builders undergoing repairs.

This cattle practice is a most important part of the training of students whose future career will be in district work, and in connection with it a new book on an important branch of bovine pathology has been prepared in Urdu, by Sirdar Shah, teacher of the subject, and which has been made one of the text books.

I trust that before long a new sphere of usefulness will be opened out. In the new buildings which are being erected is included a laboratory, and when this is ready and fitted with the necessary apparatus, I hope to be able to commence a series of experiments into the nature of some of the more obscure diseases of animals in India, especially as to the cultivation of vaccine for protective inoculation after the method of Pasteur. Should these be carried out, I hope that from Lahore we may be able to contribute some little towards the question that is attracting increased attention daily in the medical and scientific world, *viz.*, the relationship of infectious and contagious diseases between animals and man. That this is a vast and almost untrodden field of research is shown by the experiments of Signor Thomasseni in Italy, which seem to point out that, if not derived from—at all events there is some close connection between tetanus in the horse and man. The experiments of Dr. Klein in London, as to the possibility of scarlatina in the human being, being derived from the cow, and the observations of Dr. Davison in Buenos Ayres, in South America, as to diphtheria in man and fowls, all point to the possibility of brilliant results being obtained in this direction. In our own profession I trust to be able to make some inquiries into the outbreaks of the disease known as anthrax that is at times so prevalent and causes such loss amongst Cavalry horses in certain stations in India. I myself have, perhaps, peculiar views on this subject, but with-

out troubling you with my reasons, which would be too complicated to explain here, all I will say is that I have great doubts as to this disease being anthrax at all. Some few years ago I was employed in investigating a fatal disease amongst horses in Natal and the South African Colonies, known as Harn Gickners, and which was always looked on as being anthrax. The experiments conducted in a proper manner and with suitable apparatus proved that this was not the case. And that by adopting certain precautions the number of seizures was lessened, and that by following out a certain line of treatment, a larger percentage of animals recovered. Furthermore it was shown that the elaborate system of disinfection and isolation was useless, and a considerable saving in money effected in that way only; and, as I have before said, I have reasons to believe that, were a proper series of experiments instituted, which I hope to be able to do, that the same would be found to be the case in India.

With regard to the passed pupils of the College, all I can say is that, as their usefulness gets known to the public, there is an increasing demand for their services. Just before this last examination I had on my list applications for Veterinary Assistants from differents parts of India, Central Provinces and Burma, and there was not a single unemployed man I could send to fill them. Furthermore two of the last passed men have been engaged and are now on their way to Manipur.

I can speak from practical experience of their usefulness in the field, as during the recent China Lushai expedition, I had a number of Veterinary Assistants under my orders. Most of them had been educated at the Lahore College, and I may safely say that without them it would have been absolutely impossible to have worked the transport of the expedition. Out of the present year's students 44 presented themselves for examination, 20 obtained certificates as first, and 17 as second class Veterinary Assistants, 7 failing to satisfy the examiners. I must again thank Your Honor and gentlemen for favoring us with your presence at the distribution of diplomas and prizes, which I am certain will render them all the more valuable in the eyes of the recipients.

His Honor then presented the prizes to the successful candidates. Addressing the students, he pointed out that there was no lack of employment for Veterinary Assistants. The inhabitants of Lahore appreciated the advantages under the College but a wider view should be taken of it, and it should be looked on as a means of spreading knowledge over the province and Northern India. He also testified to the merits and abilities of Mr. Kettlewell. And with regard to the new buildings in the College and the proposed laboratory, said he hoped that it would be established and the experiments that the Principal mentioned that he proposed to institute, would be successful, and that useful and scientific results of interest would come of them, especially with regard to the relationship of disease between human beings and animals.

His Honor's speech was translated and given in vernacular by Dr. Rabim Khan, Khan Bahadur, Lecturer on Materia Medica at the Veterinary College.

The teachers were presented to His Honor by the Principal, and after inspection of the new lecture theatre and laboratory the proceedings terminated.

University of Pennsylvania, Veterinary Department: Commencement.—The annual commencement of the Veterinary Department of University of Pennsylvania, was held in the Academy of Music, Philadelphia, June 11th; the orations and valedictory were delivered by students of the departments of Arts and Law.

The following gentlemen received the degree of Doctor of Veterinary Medicine (V. M. D.).

Bartholomew, J. Cleaver,	Philadelphia.
Bear, Benj. S. J.,	Mt. Joy, Pa.
Bickel, Samuel D.,	Philadelphia.
Bunting, Elwood B.,	Burlington, N. J.
Conard, Milton E.,	West Grove, Pa.
Conrow, Abraham E.,	Moorestown, N. J.
Edwards, Warren,	Philadelphia.
Entriken, Harry D.,	Kennett Square, Pa.
Jolly, Charles R.,	Atlanta, Ga.
Records, John H.,	Lewes, Del.
Senseman, B. Frank,	Mechanicsburg, Pa.
Tag, William, Ph. G.,	Philadelpheia.
Wheeler, Arthur S.,	New Orleans, La.

J. B. Lippincott prize of \$100, for the best general average in examination for the three years' course, was awarded to Arthur Seaver Wheeler, of New Orleans, La.

Dr. Simon J. J. Harger has been promoted from the position of Assistant Professor of Veterinary Anatomy and Zootechnics to the full professorship of Veterinary Anatomy and Zootechnics.

Leonard Pearson, B. S., V. M. D., who is at present pursuing special studies in the Royal Veterinary School in Berlin, has been elected Assistant Professor of the Theory and Practice of Veterinary Medicine.

Dr. Alexander Glass has been elected Lecturer on the Theory and Practice of Canine Medicine, and Dr. Edwin P. Muir has been elected Demonstrator of Materia Medica and Pharmacy.

Chicago Veterinary College.—A. S. Alexander, B. A., has been appointed to the Chair of Hygiene, vice Jonathan Periam.

A course of practical inspection of meat and milk, has been added to the curriculum.

Dr. Billings, late of the faculty, has received an appointment at the University of Nebraska.

Harvard University, Department of Veterinary Medicine.—Frederick Huntington Osgood, B.S., M.R.C.V.S., has been appointment instructor in Cattle Practice.

William Orison Underwood, A.B., has been appointed Lecturer in Warranty and Evidence. The Museum and Library has been considerably enlarged.

Ontario Veterinary College.—The following graduates of the Ontario Veterinary College, have been appointed inspectors of the U. S. Department of Agriculture, Bureau of Animal Industry: Dr. M. Hawkens, Detroit, Michigan; Dr. T. J. Claris, Buffalo, New York; Dr. O. L. Boor, Muncie, Ind.

Dr. T. D. Hinebauch has been appointed Professor of Veterinary Science, Dakota Agriculture College.

ALUMNI ASSOCIATION OF THE AMERICAN VETERINARY COLLEGE.

OFFICERS FOR 1891—1892.

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Vice-President, Wm. H. Lowe, D.V.S., 188 Ellison Street, Paterson, N. J.

Secretary, E. B. Ackerman, D.V.S., 141 West 54th Street, New York.

Treasurer, Andrew Strange, D.V.S., 322 West 15th Street, New York.

Librarian, Th. Birdsall, D.V.S., 159 Crosby Street, New York.

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Dr. Theo. Birdsall, (*Chairman*.)

Drs. S. K. Johnson, L. H. Howard, A. G. Vogt, W. B. E. Miller,
M. W. Drake, W. L. Labaw.

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W. B. Rowland, D.V.S., Pasadena, Cal.

A. Edward Perry, D.V.S., (Colorado) Riverhead, L. I.

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COMMUNICATIONS.

OSTEO POROSIS.

Mr. Editor :

The article from the pen of A. Jasme commenting on that of T. H. Berner seems to me so full of errors as to the pathology of osteo porosis as to be entirely misleading. He claims that the disease is of recent origin ; that it does not admit of successful treatment ; yet, before concluding his article he admits that a "quack " of his acquaintance does make cures, and makes a specialty of treating the disease.

Fifty years ago the disease was to be met with on nearly every large farm and was so well understood that any farmer could diagnose the disease, and many of them could so far cure it as to preserve the animal in useful, serviceable condition for years. It prevailed most in malarious districts, but was not regarded as contagious or infectious. In the great corn belt of the West where clover and timothy were not much used, and corn and corn fodder were the principal foods, the disease was very common. But in the same region to-day, a half-dozen cases cannot be found in a year's practice, and the ordinary, clod-hopping, country veterinarian finds no trouble in fixing up the majority of these. It is true there is a stage of the disease frequently reached before treatment, when every bone in the structure is diseased, and the tendons lose their attachments—when medication is useless. So there is a stage when a fire in a burning building is beyond the control of the firemen ; but there was a stage when a bucket of water would have extinguished it.

The time was when many barbarous methods were resorted to in hope of curing the disease. But as the nature and causes of the ailment came to be understood, more rational and humane treatment was found efficacious. When it was found that the diet was largely responsible and a corresponding change was made, the cases of the disease began to decrease in number, and now when they do occur, are amenable to treatment.

In the February number of the *N. Y. Veterinary Review*, I gave my treatment which I have found to give the best results. So-called scientists may attempt to prove the disease contagious, infectious due to germs, &c., but the facts are wanting to establish any of their theories. Many of our scientific writers are about as well equipped for their business as the man I heard of some years ago. He was taking a ride over the Central road. He was gazing from the car windows on the varying landscape. A son of the soil occupied an adjoining seat. Our traveller, pointing to the fields, asked the farmer as they passed under review, what the vegetation was. Having answered a number of these queries, the farmer in turn became inquisitive and said: "You don't appear very familiar with country life. May I ask where you live and what business you are in?" To which came the reply: "No, I seldom get to the country; my business is very confining. I live in Chicago and am editor of an agricultural weekly."

If these theoretical veterinarians who write so learnedly on the diseases of stock would take a trip to the country occasionally, and come into contact once and awhile with an actual living, breathing horse or cow, instead of consorting only with the cows and horses of their imaginations, they might find there is more in heaven and earth than is dreamed of in their philosophies.

In such case, too, it might not be possible, as it is now, for a newly-fledged veterinarian to become an Assistant State Veterinarian, and go about the country shooting valuable horses for supposed glanders, and thus obliterate all evidence of ignorance and mistaken diagnosis. But purity and politics do not always walk arm in arm with knowledge, hence ignorant pretension with a political pull gets to the front while modest merit is relegated to obscurity.

Eastern legislation is tending to placing the entire live stock interest in the hands of a few. We, in the West, are watching for the outcome of your quarantine laws.

We do not take much stock in Court findings. I believe it was a New Jersey Court that granted a woman a divorce from her

husband on account of his impotency, and the same Court convicted the husband of bastardy.

Good, wholesome laws for the protection of the live stock interests are desirable, but they should be framed so as not to be in the interest of the unprincipled money seeker. But little legislation is needed. Self interest is usually ample for protection. Contagious diseases will be speedily stamped out without legislation; as every stock owner is interested and ready to co-operate in effective measures.

I am truly glad that there are several journals in the country striving to elevate the standard of veterinary qualifications. True, practical knowledge is what is needed, not unsubstantial theories. Every stock owner should be a subscriber to some good stock journal. As for myself I would prefer to economize in anything rather than in my veterinary literature.

V. G. HUNT, V. S.

REVIEWS.

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VOL. XII.

AUGUST, 1891.

No. 8.

HISTORICAL DEVELOPMENT OF THE HORSESHOE.

BY DISTRICT VETERINARIAN ZIPPELIUS OF WÜRTZBURG.

*Translated by S. E. Weber, V.S.**

Kind gentle steed, nobly standing,
Four shoes, will I put on your feet,
Firm and good, that you'll be fleet,
That is Donar's hammer saying.

To the woods and homeward go,
Always on the straight road thro',
Far from what is bad, still fleeing,
That is Donar's hammer saying.

Should wounds and pain become distressing,
Blood to blood shall flow,
Bone to bone shall grow,
That is Donar's hammer saying.

Carry the rider, true little steed,
Onward to all good luck bringing ;
Carry him thence and back with speed,
That is Donar's hammer saying.

(Old Meresburger Song.)

The horse appeared comparatively late in the group of domestic animals. In searching the monuments of the ancients, which have furnished the foundation for our present culture, that is of the litoral inhabitants of the Mediterranean and of the people of Mesopotamia, we find in Egypt the first traces of the horse.

* From *Theirärztliche Mittheilungen*, organ des Vereins badischer Theirärzte, Karlsruhe, No. IV, April 1891.

But even here it appears late, on the monuments of the first ruling patricians of human origin.* Especially during the period of Memphis, (I-X Dynasty), then under the rules of Thebes (XI-XVI Dynasty), there is no trace of the horse.

It is first in the transition period, from the late rule of Thebes (xvii-xx Dynasty) to the so called period of Sut (xxi-xxx Dynasty) that there appears, in the wall pictures of the Pharaohs' tombs, representations of the horse. The oldest, now known, picture of the horse is found on the walls of the tombs of Seti I. (1458-1507 B. C.) under whose reign the Israelite wandered from Egypt. The horses of these mortuary pictures are very well drawn, and have an unmistakable oriental type. There has therefore undoubtedly existed in Egypt high culture, for over 4000 years, without representation of the horse which was the next animal domesticated after the cat.

From this time on we find the horse frequently represented both by the vain-glorious Despots of Mesopotamia, and on the so called etruscan vases, which appeared after the influence of Greek art, when on almost every urn, horses in lively action and in various forms of bodily development, but almost always of an oriental type, are to be recognized. But neither here, nor in Homer, nor in the many later representations of the horse on the Roman triumphal arches etc., are to be found horses, whose hoofs have any trace of protection. Records, which describe to us the misfortunes of armies, whose horses had run their feet sore, we find on the contrary at a very early time, as in Diodorus, regarding the cavalry of Alexander the Great, in Xenophon, regarding the retreat of the ten thousand, in Polybius, regarding the cavalry of Hannibal in Etruria, etc. It is also known that the cavalry of the linguist King of Pontus, Mithridates the Great, at times and specially at the siege of Cyzicus were delayed, in order to let the hoofs of the horses grow.

On the contrary it seems strange that of the Huns alone, whose horsemen swept over whole continents from the Asiatic highlands like a thunderstorm, such trouble had not become known either through the numerous authors of the Eastern and Western Roman Empire or from Gallia.

Horse-shoeing, very likely, was invented by different nations at about the same period during the migration of the nations, and the various kinds of new inventions were brought together in

*Until the time, Menes, with whom historical times begin, ruled in Egypt among visionary Heros or Mythological Gods.

Germany only, after each had acquired a national stamp according to climate and usefulness.

In this way come from the South, the thin, plate-like horseshoes, with staved rim, covering the whole hoof; from the Mongolian tribes of middle Asia the "Stolleneisen" (calk-shoe); whilst to our Northern ancestors, and indeed the Normans, must be ascribed, with great probability, the invention of the "Griffeneisen" (gripe-shoe) especially for the protection of the toes.

All varieties of the horseshoe of southern Europe are easily distinguished from the Roman so called "Kureisen" (cure-shoe) of which several have been un-

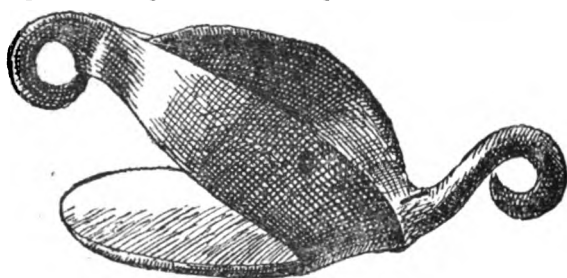


Fig. I.

earthed at various excavations and are preserved at the Romo-Germanic Museum in Mentz, (Mainz) Germany. The shoes (Figs. I. and II.) each represent thin iron plates, covering the whole hoof, which in some cases have an opening in the middle, of several centimeters in diameter.

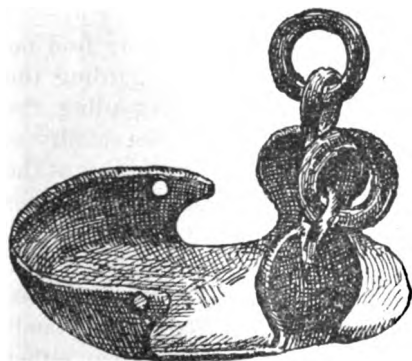


Fig II.

These plates, apparently set forth to suit oriental and occidental body-conformation, are either directly provided with loops, or have around the outer margin a brim several centimeters high, in which rings are fastened. Through the loops or rings small ropes were drawn and in this way the shoe was fastened to the crown of the hoof and to the pastern. Sufficient se-

curing of the toe was wanting in all these shoes and on account of this, the movement of the animal with the same, must have been very clumsy, and we can see from this that the ropes must have made the crown of the hoof and pastern sore in a short time. One of these shoes * evidently was the object of improvement, to

* Not illustrated.

prevent the animal from slipping as well as from friction, and we therefore find on it three iron cubes $1\frac{1}{2}$ centimeters high, which were fastened corresponding to our toes and calks of to-day, and offer a very early ready proof, from our climatic and mountainous conditions, which later occur, principally in southern Germany, that this style of horseshoeing was not caused by error, but by a well-founded local and national interest or want.

Aside from the so called "Kureisen" (cure shoe) for diseased hoofs we find very little from the Romans on horseshoeing or hoof-protection, and therefore we must observe special precautions with all their literature on the subject. It is because of this that I excuse Prof. Sittl's communication in the preface of Wickelmann's "*Geschichte der Kunst in Alterthum*" (History of Ancient Art) which contains a notice, that Fabretti in some raised work in Plazzo Matti, of a representation of a hunt by the Emperor Gallienus (Bartoli Admirand Ant. Tab. 24), showed that at that time horseshoes fastened by nails, the same as to-day, were used (Fabretti de Column. Traj. C. 7 pag. 225; Conf. Montlanc. Antiq. explic. T. 4 pag. 79). This statement proves itself erroneous, because he was not aware that the foot of the horse was repaired by an inexperienced sculptor.

How then did out of this Roman cure-shoe develop the horseshoeing of southern Europe?

It was to be expected, with the Roman horseshoe, that the mode of fastening became unsatisfactory and necessitated a remedy or change. An attempt of this kind has been preserved in the so called "Asiatischen Koppeneisensole" (Asiatic Cap-iron-sole) (Fig. III.) which the Honorable Mr. Lydtin at Karlsruhe

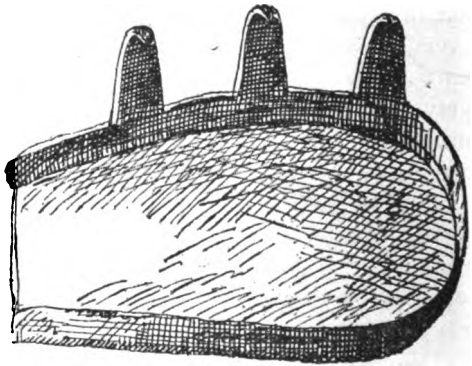


Fig. III.

had made according to a model of the Circassian Horse Tribe Shaloks, and also according to the reverse of Lycian coins (called Triguetra).

This horse-shoe-plate likely originating in the 12th Century covers the whole surface of the sole, like the Roman shoes, with the exception of the wall region which contains a rim 1 centim.

high, and above this rises at one side towards the heel, three beak-like projections about 4 centim. high and 1 centim. wide at the base, being pointed above and turned down, which were fastened in the wall of the hoof, in the form of a hook.

This mode of fastening evidently was also insufficient and so the fastening of the shoe by nails was adopted. These iron plates used for shoes were too thin to allow nails with sunken heads to be used, so only nails with blades and cubical shaped heads were applicable. These nail-heads 6 to 8 in number, which left the toe and the back part of the heel free, served at the same time to secure the horse from slipping which the smooth plates, covering the whole hoof-surface, without doubt facilitated.

Shoes of this kind, after the old Roman style, with a very strong rim bent upwards, likely proved very comfortable for the purpose of protection, in the Sierras of the Pyrenean Peninsula, where they seem to have been in use for a

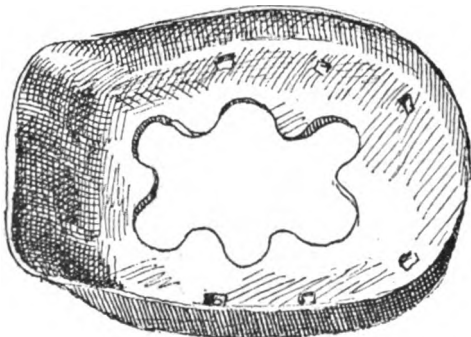


Fig. IV.

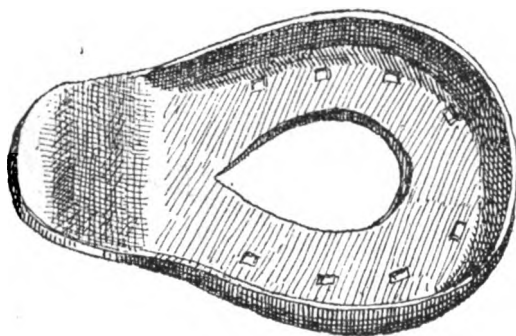


Fig. V.

long time; for in the 12th Century we find in Spain the whole form of the Roman shoe, only fastened by nails (Fig. iv. and v.). At first the shoe seems to have been cut off at the heel end, but as apparently after being on for some time, bruises were noticed, the shoe was made longer at the heel, and this part was turned up so as to prevent them from becoming loose too soon, as both the Spanish horseshoes of this period show, and the acquisition was even later transferred to England (Fig. vii.).

The shoe containing a groove (Fig. VI.) which we shall see later, made its appearance in Germany in the 15th Century. From this time, according to our present knowledge, ceases the period of the Roman horseshoe. Its influence however, lasted a great deal longer, and has even remained until our present day.

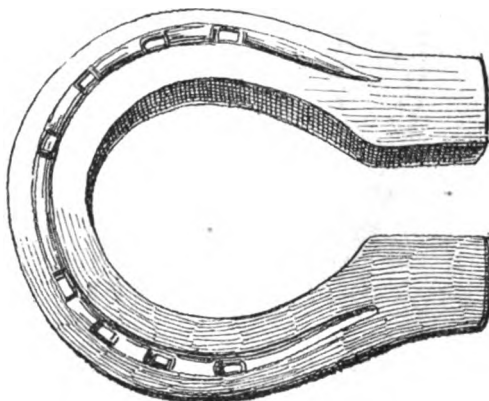


Fig. VI.

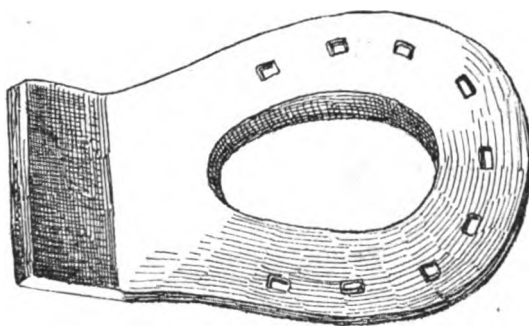


Fig. VII.

Its successor became partly the Arabo-Turkomanic and partly the Southwest European horseshoe.

For the descendants of the Numidian light cavalry, the Roman and old Spanish horseshoe was evidently too heavy for their sandy, roadless deserts, so they made it thinner and omitted the bent up rim, because it prevented the quick movement of the horse. For the protection of the nail-heads the outer margin of the shoe was staved, so as to form a small rim on the outer surface of

the shoe, thus preventing the nail-heads from being worn and the shoe lost too soon.

A horseshoe of that kind is shown by Fig. VIII. which was used in North Africa in the 12th Century, and became the model for all forms of horseshoes of the Mahometan tribes. Even now quite similar shoes (Fig. IX.) are made South and East from the Caspian Sea, at the Amu-Darja, in Samarkand, &c., which were probably introduced under Tamerlane, the conqueror of nearly the whole of Asia-Minor in the fourteenth Century.

The so called "Samrat-sche" (Sarmatian) horseshoe (Fig. x. and xi.) of South Russia shows in its form at the same time, traces of the last named shoe, however, greatly influenced by the Mongolian shoe, the "Goldenen Horde," which at the turn of the 16th to the 17th Century played havoc at the Volga, and the Aral. The unusual width of the toe, and especially the lightness of the iron, reminds us of the Turkomanic horseshoe, whereas on the contrary, the large bean-shaped holes, as well as the calks, were furnished through Mongolian influence.

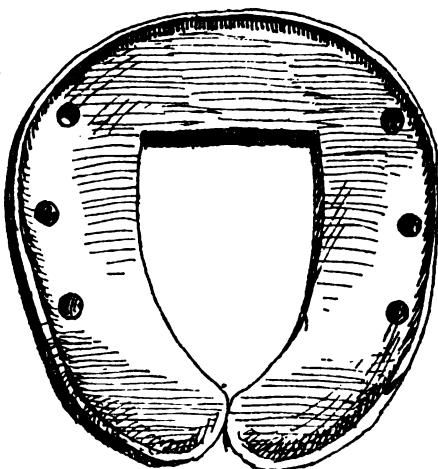


Fig. VIII.

The Sarmatian tribes were principally horsemen and it is not surprising therefore that the coat of arms of the former Kingdom of Poland in the 2nd and 3rd Quadrate shows a silver rider in armor on a silver running horse shod with golden shoes, and that

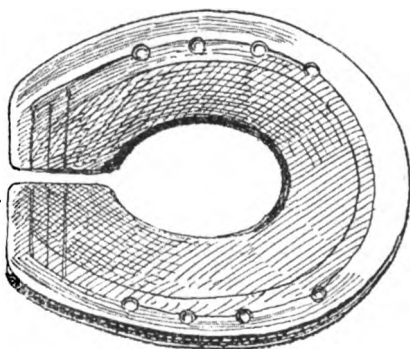


Fig. IX.

at present about 1000 families in 25 lineages of the Polish Counts Jastrzembiec Bolesezy the so-called "Polnische Hufeisen Adel" (Polish Horseshoe Nobility) at the same time also carried the horseshoe on their coats of arms. The silver horseshoe in a blue field appears here as a symbol of the "Herbestpfardes" (Autumnal-horse) to which, after the christianization of Poland, was added the golden cross. The noblemen participating in the murder of the holy Stanislaus in 1084 had to carry the horseshoe reversed on their escutcheon.

From the African and Turkomanic horseshoe, through the turning up of the toes and heels, originated later, the Turkish,

Grecian and Montenegrin horseshoe of the present, as shown by Fig. XII.

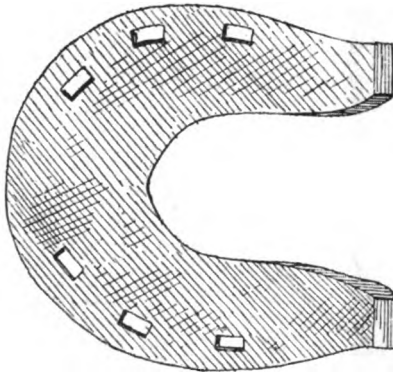


Fig. X.

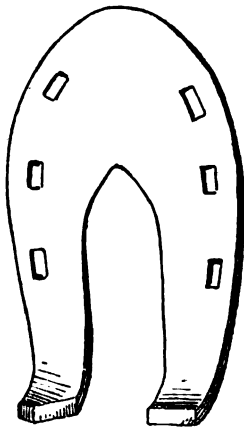


Fig. XI.

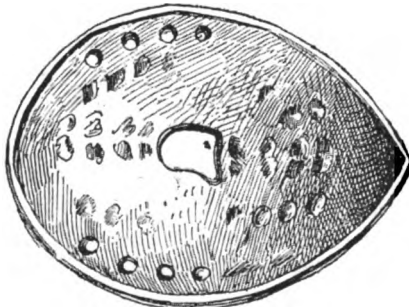


Fig. XII.

By the Moorish invasion in Spain the Spanish-Gothic horseshoeing was also modified, through which, the shoe became smooth, staved at the margin, very broad in the toe, and turned up at toe and heel, and at a later period the old open Spanish national horseshoe Fig. XIII. was developed; as we thus see, we can in no way deny the Arabian-Turkish origin of this shoe.

As France had received her whole culture from the South, and as the Crusades especially brought the Roman nation in close contact with them for centuries, so it cannot appear strange, that the old French horseshoe, a form of which has been preserved by Bourgelat and is represented by (Fig. XIV.), still remained in the smooth, turned up in front and behind, like the shoe of the Southern climates, with Asiatic traces, which hold on the ground, the same as all Southern shoeing, by the nail-heads.

The transit of the German Empire, in order to keep up the historical course, once more brings us back to the middle of the fifth century. At this time Attila, the "Godegisel" (Gods' scourge), left his wooden capitol in the

lowlands near the river Theis, to go to the Roman Empire

and to the German and Gallican provinces, there to spread indiscrible misery to the horrors of judgment day.

The following is a prayer in those days of horror.—

“Kleiner Huf, kleines Ross,
Krummer Sâbel, spitz Geschoss—
Blitzesschnell und sattelfest :
Schrim uns Herr von Hunnenpest.”

We are at present reminded of those times of fright, when during the clearing and tilling of the soil, a small roughly made horseshoe is found in Southern Germany, about as far as the water boundary of the Thuringian forest, and occasionally on, but principally around Augsburg, and in France as far as the Loire.

These shoes covering the margin or wall of the foot, show slight traces of having been beveled on the lower surface, and contain two bent calks very superficially placed, occasionally they are sharpened and turned in two directions. The characteristic wide bean-shaped nail-holes, are conical on the inside, and are frequently placed so near the outer margin of the shoe that from the pressure the hoofs were likely to split open. The nail-heads were shaped like a sleigh runner, and almost entirely sunk into the shoe. It evidently was not bent up at the toe, like old form of these kinds of shoes.

These shoes, according to our conception of to-day, were so carelessly finished that in the scientific circles of historical researches they were, until very recently looked upon as saddle mountings or something similar and not as horseshoes.

This shoe was for some time, while it was plentifully found in



Fig. XIII.

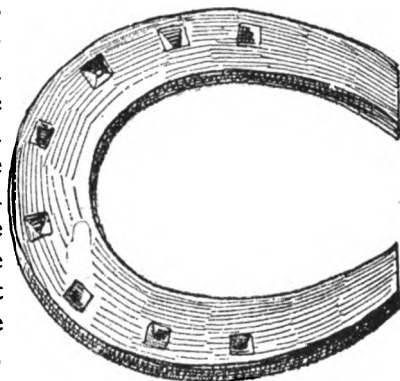


Fig. XIV.

France, regarded as of Celtic make ; but this is certainly not the case, as it is of Hunish and Hungarian "Nationalitat" (Nationality). An exactly scientific proof, it is true, according to



Fig. XV.

our present knowledge, cannot be furnished; however, it will stand well enough until the error is proven.

This peculiar kind of horseshoe, has been found in South Germany and North-east France, as far as the region of Orleans, where, as it has been proven the Huns appeared. This therefore, speaks for their descendants: 1st, The far extended and yet sharply limited places of finding the shoe ; 2nd, The small size, corresponds to the historically

proven smallness of the Hunisch horse ; 3rd, The hasty and careless make, which does not indicate that it was made by settled workmen ; 4th, The horseshoe (Fig. xv.) be-speaks the Hunish workmanship of the present Chinese shoe, which, in making of the nail-holes, shows to-day, related touches of the productions of the Mongolian Ancestors.

Aside from the peculiar shaped nail-holes, the characteristic of the Hunish shoe, consists in the changes of the calks for summer and winter shoeing, as well as in the sinking of the nail-heads. The Huns therefore, aside from the indistinctly marked attempts of the Romans in this direction

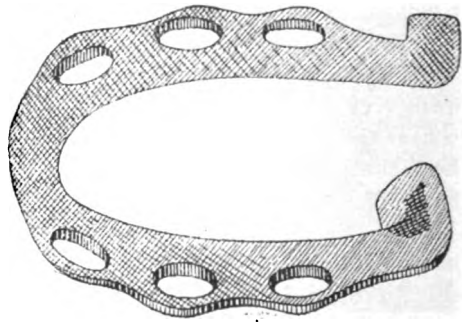


Fig. XVI.

which are the only ones known to me, must be regarded as the inventors not only of the calks, (but partly next to the Normans) also of the sharpened winter shoeing, and of the not unimportant invention of sinking the nail-heads observed in Fig. xv.

The Hunish shoeing was therefore an important invention for

the Germans. After centuries later, wherever horse-shoeing was practised, it was done solely according to Hunish methods ; where by the shoe was very possibly made heavier, was more carefully finished and in course of time showed an attempt to bend the toe (Fig. xvi. a).



Fig. XVI a.

In the Bomberg Dom we find an equestrian statue, not unknown in the history of art, which was formerly held to be that of Emperor Conrad III ; at present however, the opinion prevails generally that it represents "Stephen I, den Heiligen" (Stephen I, the Saint.)

Stephen I, the first King of Hungary formerly was a heathen and was named "Najk". He reigned from 997 to 1038, his important events were the many

victorious wars led against rebellious chieftains of his country, and he was canonized in 1087. His equestrian monument in Bomberg Dom was, in consequence hardly made before the year 1087. Notwithstanding that the Huns had been defeated 500 years before on the plains of Catalania, the horse of the above mentioned monument carries, as I have convinced myself personally, Hunish horseshoes, modified however, by blade shaped calks just then coming into use. This is proof that, at least in Hungary the Hunish method of shoeing, was preserved an extraordinary long time. By this it has not become improbable, that at least the many shoes of this kind, which were found on the Lechfield, come not directly from the Huns, but from their successors, the Hungarians, whose invasions took place in the first half of the 10th Century.

About the same time of the Hungarian invasions, the Normans began to disturb the South-western part of Europe with their Viking expeditions. Their Sea-King's seem to have been equestrians at very early times, and to have had their horses shod, although perhaps only in winter ; at least the excavation of the Viking ship in 1881, disclosed the remains of a horse which was shod. The shoeing consisted only of a toe protection—"Brodder" (Bruder)—(Brothter)—provided with a small sharp calk, ar ! fastened by two nails.

When later in the year 1130, the Norwegian king Sigard Yorsalafar, during his journey to Jerusalem, entered Constantinople, his horse is said to have carried only the small toe-protecting shoes.

The art of horseshoeing, immediately after the migration of the nations, came near our improvement of the same to-day ;

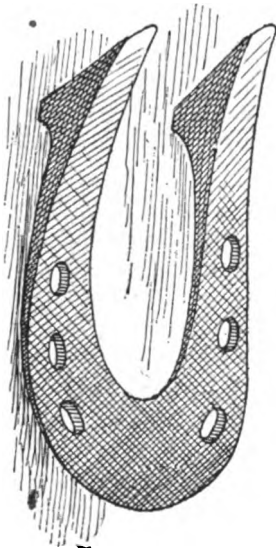


Fig. XVIII.

especially near the reputed discoveries met with, which consist simply of iron protection for the margin of the hoof, fastened by nails. The heads were sunk into the shoe so as to increase its firmness. Special consideration was given to local and climatic conditions through the introduction of toes and heels.

The mechanism of the hoof also found remarkable consideration, inasmuch that they apparently avoided driving nails too close to the heel end of the shoe. Notwithstanding this early improvement in the art of horseshoeing, the Huns (as stated before) took a prominent part. It appears to have taken a long time after

the migration of the nations for shoeing to become general, as is shown by various descriptions of tournaments, picture of horses, etc.

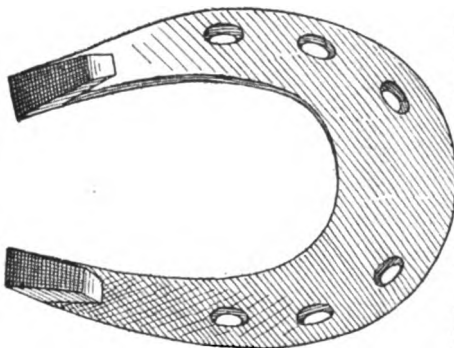


Fig. XIX.

We will mention in the first place the "Percival des Wolfram Von Eschenbach," as well as "Christ. Von Troies," where there is a great deal said about horses, horse-grooms, and tournaments, but nowhere

in those works is any mention made of horseshoeing. Likewise is found the horse on the coat of arms, of Wolfram Von Eschenbach, in the Manessi collection in Paris ; which was begun in Switzerland in the 14th century ; but, although, we find this horse most beautifully finished, it was not shod.

During the time of the Crusades, 1096-1291; however, there appeared suddenly in Germany, a plate-like horseshoe of Southern character (Figs. XVIII. and XIX.), which was occasionally bent upward at the heel end, and was very heavy. The toe was very broad sometimes, and was also bent upwards.

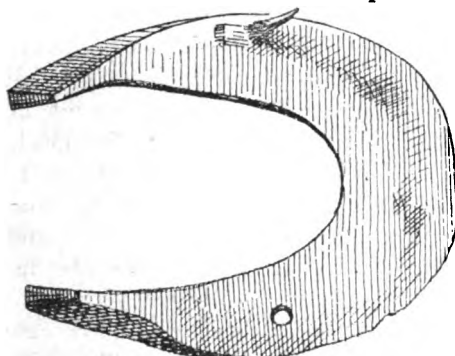


Fig. XX.

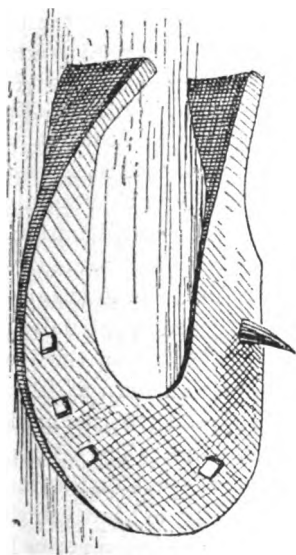


Fig. XXI.

This South European-Hunish horseshoe, had remained the standard form during the middle ages and until the 30 years

In this form we have seen the shoes of the Balkan and Pyrean Peninsula. The shoe was remarkably narrow at the heel, and was supplied with calks, which accounts for the highness of the back part of the shoe. Frequently we find one calk set diagonally, but the other drawn out wedge shaped, and sharp; so that there existed a

great similarity between this iron shank and that used by Count Einsiedel for winter shoeing. Sometimes both shanks were sharpened in this way, or were provided with blade-shaped calks well set forward. The form of nail-holes used was very characteristic of that of the Huns, but they were decidedly smaller and square, as were seen in the African shoe of the 12th century. The nail-heads were slightly sunk, which was according to Southern customs.

That this shoe really belongs to the period of the Crusades, is proven by the numerous horse-pictures which have been preserved from that time; of which we will mention the manuscript of Heinrich Von Veldecka ("Eneidt")* in the

* "Wanderungen des Aeneas" (Travels of Aeneas).

war, at least in South Germany. The shoe was continually improved, and reached its highest point of perfection, about the time of the "Bauernkrieg" (Revolution of the Peasants) at a time when, under the leadership of the Renaissance, the whole art of mechanics, and especially that of blacksmithing had taken an extraordinary great stride (Figs. xx. and xxi.).

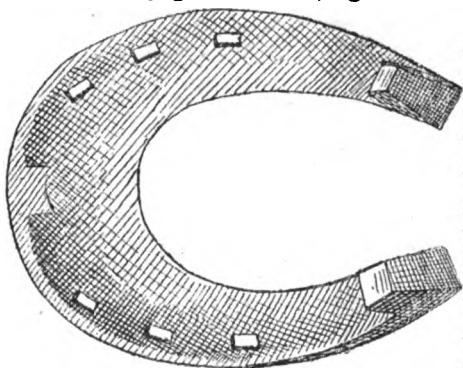


Fig. XXII.

The shoe (Figs. xxii. and xxiii.), is found in Franconia, in all places, where in the 16th century, battles had been fought with the rebellious peasants. We may, therefore, be justified in fixing its origin mainly, from that period, for which also speaks its high perfection of form. We find here still, the bent up heel and

toe, (the latter broad and thin) of the south European form.

The staved rim of the Spanish-Arabic-Turkomanic shoe, is observed to be undergoing a change to that of a groove. The broad surface of the shoe evidently led to the bevelling of the same, so as to lessen sole pressure. The size of the nail-holes remains still like that of the Huns; but the unsunk Southern nail-heads, yet serve to improve the hold on the ground. The calks were next placed forward, perhaps from an uncultivated sense of beauty, or from the high bending up of the hind part of the shoe, which would necessitate a high and heavy unsightly calk.

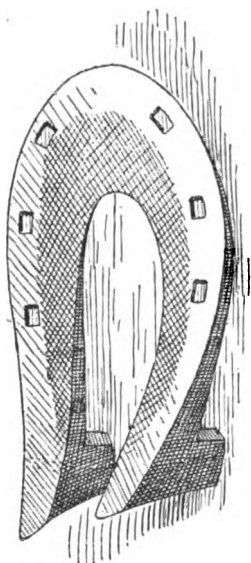


Fig. XXIII.

From this time on horseshoeing in south Germany fell back very quickly, and loses all scientific holds of support after the 30 years war. In the meantime, toe protection in the form of a calk had spread from the colder north over southern Germany;

whereas this north-German invention did not find favor in England in consequence of her mild oceanic climate. Also, the calks in England, as well as in the southern countries, on the same ground, therefore with good reason, could at no time be adopted. This did, however, not interfere with the use of the calk in the colder south-Germany, where after a use of nearly 1500 years it has maintained its local and climatic adaptation. Notwithstanding the occasional apeing by foreigners, it has remained victorious in its original form, and has been chosen in many countries.

The historical development of the horseshoe in general, from about the time of Emperor Maximilian until the seven years war, furnishes a true picture of the confused condition of things at that period of time, which to make intelligible, would require a separate and complete treatise. Interesting as it is to the scientist, to follow up this development, and mode of present German horseshoeing, which aside from the National toe and calk, is the English form and has become influential and with full right, for a periodical of this kind further, more comprehensive statement, would under all circumstances take up too much room ; wherefore, I must drop the pen, although reluctantly.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VET.

[*Continued from page 332.*]

ARTIFICIAL IRREGULARITIES.

From time immemorial, the lower class of horse dealer, like his congener in any other trade, has studied, to learn and practice deceptive means for giving his articles for sale an apparent greater value than they really have. With this view, the dishonest breeder in the country attempts to hasten the appearance of age of his colts, to place them on the market as adult animals, and save a year's feed and cost of care when they are yet undeveloped; the city dealer fashions the mouth to destroy the evidences of cribbing, even at the risk of making the horse appear a year or two older, or alters the tables of the teeth to deceive the inexpe-

rienced buyer into thinking an old horse to be one just arrived at adult age.

Within recent years, moreover, especially in America, there has arisen a fraternity of "Equine Dentists," a guild endowed with great enthusiasm who not only relieve the animals suffering from irregular and sharp molars, but with artistic skill remodel the whole mouth, and produce changes, which sometimes greatly complicate the characters of the teeth, as indications of the age of the horse.

REMOVAL OF TEMPORARY INCISORS.

IN ORDER TO AGE THE HORSE.

In Ireland, in Normandy in France, in Virginia and in some sections of the West, the temporary incisors are drawn, sometime before they would naturally drop to be replaced by the permanent ones, in order to hasten the eruption of the latter. If the intermediate incisors are drawn in a rising three-year-old, the permanent ones appear at three years or soon after, and if the temporary corner incisors are then drawn, they are replaced in a few months by the permanent teeth, so that a rising four-year-old may have all of its permanent incisors, and the mouth of a four-year-old off, may have the appearance of that of a horse a year older. The condition of the tush teeth does not control the age to any extent, as some horses have them between three and four years of age, and in others their eruption does not take place until six.

We have seen that when the incisors first appear, they emerge from the gums somewhat obliquely and later take their proper position, making the incisive arch a regular rounded curve. When the permanent incisors have been hastened by the removal of the temporary ones, the former keep their oblique position, the arch is never regular and is evidently diminished in width. If the removal has been recent the parts are inflamed and there is sometimes a periostitis, which is evidently traumatic in origin. When such an irregularity is seen, the obliquity of the teeth in the curve of the incisive arch, a comparison of the two incisive arches (for frequently the deception has only been practiced on the lower teeth), and a comparison of the worn tables of the pincers with the fresh edges of the others, is sufficient to show the fraudulent interference, which has been executed. There are frequently cicatrices showing the forcible removal of the teeth.

De Curnieu questions that the drawing of the temporary teeth hastens the eruption of the permanent ones; but Mayhew maintains the contrary, with which my own experience coincides. Mayhew says they can be hastened by the application of a hot iron to the gums.

The question was put to a large number of breeders by MM. Goubaux and Barrier and was answered, by all but one, in support of the opinion that the eruption of the permanent teeth is hastened by the removal of the milk teeth.

BISHOPING.

Bishoping is a method employed by gyps, to alter the appearance of the incisors, which can only deceive buyers who are entirely ignorant of the horse's mouth.

The crown of the incisors of the young horse are wide from side to side; the dental tables are modified as the animal becomes older, and become successively oval, rounded and triangular; the cups at first occupy the whole table, and are usually filled with dark-colored cement or black, foreign matter; they gradually diminish in size, approach the posterior border of the teeth and then disappear; in the centre of the table the dental star appears.

Bishoping consists in giving to the tables an artificial cup of a dark color.

The teeth, usually, are first filed even; each table is then gouged out until somewhat concave and the new cup is then blackened, either by nitrate of silver, or by a point of white-hot iron. It is only practiced on the lower incisors.

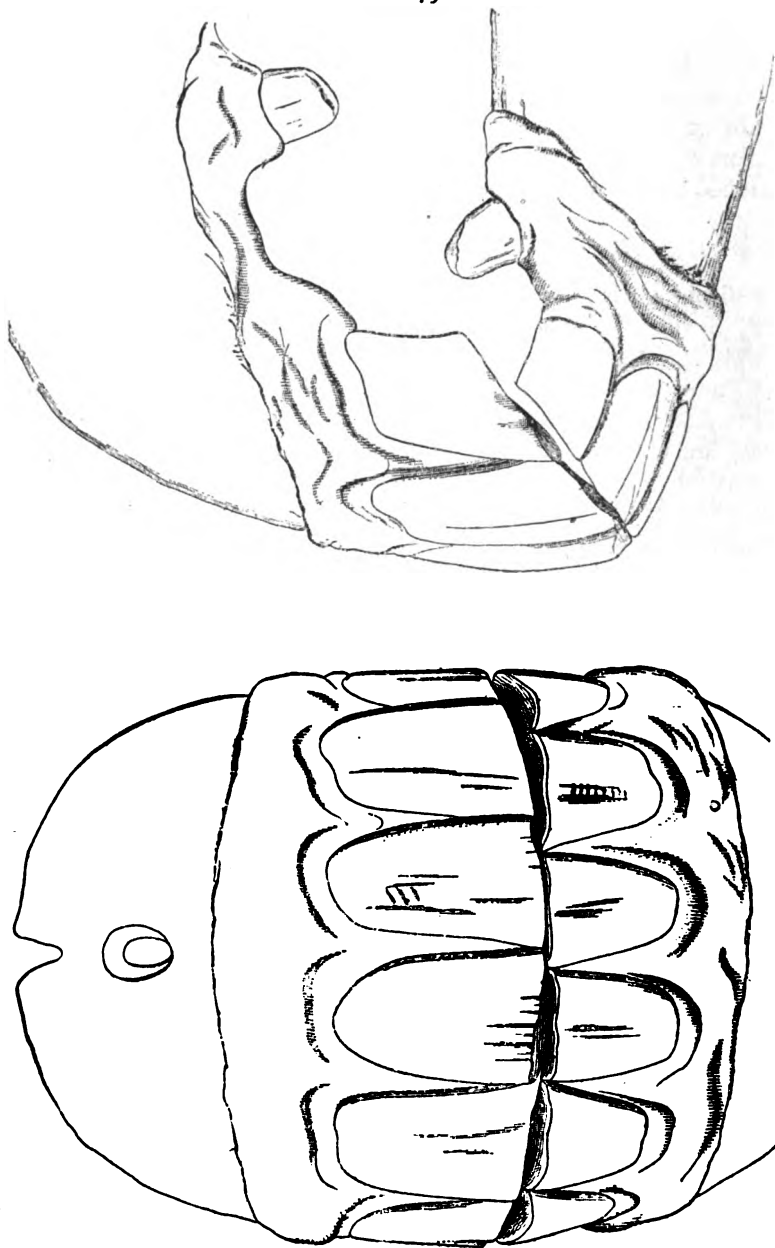
Bishoping is readily recognized on a proper examination; as, with the shortened lower teeth, the tables of the two incisive arches usually do not correspond (Fig. 79); and the enamel of the diminished cup of the horse is found posterior to the artificial cup, or has disappeared (Fig. 80). In bishoped mouths the artificial cup is found on the tables of wounded or triangular teeth, in which they normally would not be present. In bishoping, the tushes are frequently filed down, to point them and make them appear fresh and small; this is evident from the roughened surface, and unnatural shape.

DRESSED MOUTHS.

The notch on the upper corner incisors and the whole tables of the incisive arches are frequently filed down, in "dressing" the mouth. If recently done the roughened surface is evident,

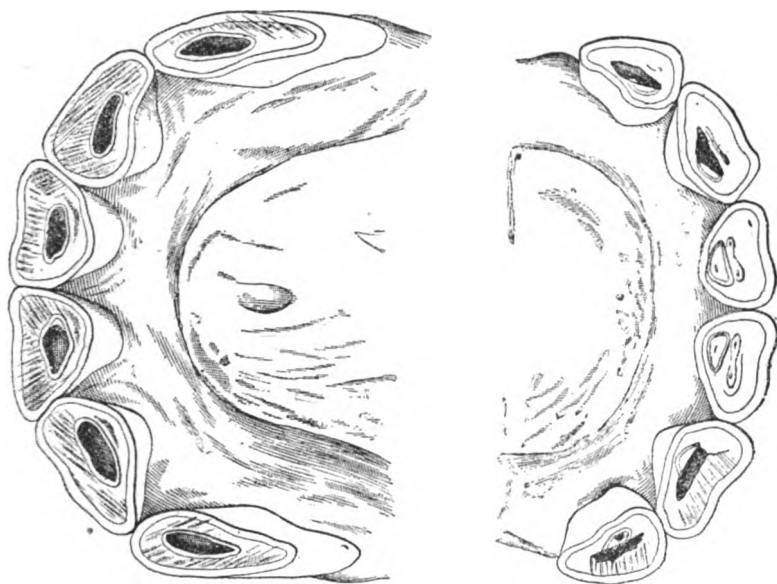
and at other times it may complicate the appreciation of age to a certain extent, but the incidence of the jaws, the form of the

FIG. 79.



tables, the conformation of the maxillary bones, etc., should prevent a deception of any importance.

FIG. 80.



Figs. 79, 80. *Bishoping*.—From in front the figure shows a space above the corner and intermediate teeth made by their having been filed. This is seen more plainly in profile. The tables show the roughened surface left by the file, and the artificial, blackened cups, at the posterior border of which are seen the real cups, surrounded by enamel.

PECULIARITIES OF THE ASS AND MULE.

To determine the age of the ass and mule requires an extension of the rules which have been applied to the horse. In the young animal the eruption of the milk teeth and their replacement by the permanent teeth is about the same.

In the ass and mule, the incisors are small and narrower, and are less conical in shape than in the horse. The crown of the teeth is much longer and the root is shorter. The dental cup is continuous until a late period of life, as it is proportionately deeper. The cups are often imperfect behind. As the teeth are harder and more resisting, they wear much slower and, consequently, the tables change their form more slowly. The teeth

are more solidly imbedded in their alveolar cavities, and an excess of gum fixes them firmly. The dentine is more discolored and darker; the whole tooth is harder and resists the wear of dense fibrous food better than that of the horse and, consequently, does not wear so fast. The form of the tables is of less value, while the form of the arch and the obliquity of the teeth is more important. After seven years the elongated teeth, and their approach to each other in a horizontal line, with the thinning of the maxilla, and the deposit of cement, the dark color, and the narrowing of the incisive arches are evidences of age.

The dental tables change from a round to a triangular form, which is complete at seventeen or eighteen years. At this age the cups may disappear and be replaced by the dental stars. The incisors become parallel to the maxillary bones and converge at their free extremities, in very old age.

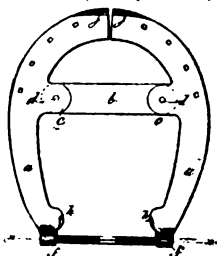
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office for Month ending July, 1891.

454,851. HORSESHOE. GEORGE T. CHAPMAN, White Plains, N. Y., assignor of one-half to William Harvey Merritt, New York, N. Y. Filed Aug. 8, 1889. Serial No. 320,169. (No model.)



Claim.—1. In a heel-expanding shoe consisting of two parts divided longitudinally and unconnected at the toe, said parts each having a joint-lug on the inner edge about midway between the toe and heel, and separately pivoted thereby to the respective extremities of the connecting-bar, coupling the two parts at pivotal points located at the inner edges, or thereabout, of the said parts, respectively, substantially as described.

2. The improved heel-expanding horseshoe, consisting of two parts divided longitudinally at the toe, each part having a joint-lug on the inner edge about midway between the toe and the heel, and said parts connected together by the cross-bar pivoted at the ends to the joint-lugs of the respective parts of the shoe, and by an expanding-screw at one end, substantially as described.

3. The improved expanding horseshoe, consisting of two parts divided longitudinally and unconnected at the toe, each part having the joint-lug on the inner edge about midway between the toe and the heel, and said parts connected

together by the cross-bar pivoted at the ends to the joint-lugs of the respective parts of the shoe, and by the heel-expanding screw, substantially as described.

4. The improved heel-expanding horseshoe, consisting of two parts divided longitudinally at the toe and having the heel-expanding clips, and being joined together between the toe and the heel by the bar pivoted at the ends to the joint-lugs of the respective parts and coupled at one end by an expanding-screw, substantially as described.

5. The improved heel-expanding horseshoe, consisting of two parts divided longitudinally at the toe, joined together between the toe and heel by the bar and joint-lugs, and having the heel-expanding rod fitted in eye-terminals of the heel extended upward above the level of the shoe, substantially as described.

6. The improved heel-expanding horseshoe, consisting of two parts divided longitudinally at the toe, jointed together between the toe and heel by the bar and joint-lugs, and having the heel-expanding rod and toe-clips, all substantially as described.

7. The improved heel-expanding horseshoe, consisting of two parts divided longitudinally at the toe, joined together between the toe and the heel by the bar and joint-lugs, and having the heel-expanding clips, substantially as described.

Claim.—1. In an animal-stock, a base, up-rights carried thereby, and cross-pieces secured to the uprights, in combination with sliding jaws mounted between the cross-pieces, and levers carried by the up-rights and connecting with the jaws for opening and closing the same.

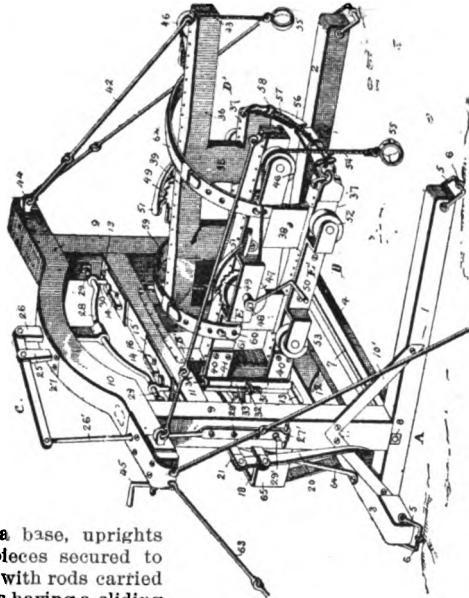
2. In an animal-stock, a base, uprights carried thereby, and cross-pieces secured to the uprights, in combination with sliding jaws mounted between the cross-pieces, mechanism for opening and closing the jaws, and adjustable side wings hinged adjacent to and adapted to move laterally in unison with the said jaws.

3. In an animal-stock, a base, uprights carried thereby, and cross-pieces secured to the uprights, in combination with rods carried by the crosspieces, side wings having a sliding connection with the rods, and mechanism for raising or lowering the said wings.

4. In an animal-stock, a base, uprights carried thereby, a cross-piece secured to the upper ends of the uprights, and slotted cross-pieces secured to the uprights between the base and the top cross-piece, in combination with rods carried by the slotted cross-pieces, side wings having collars loosely engaging the rods, collars located between the collars of said wings and having lugs thereon, a lever carried by the top cross-piece, the mechanism connecting the lever and the lugs, whereby when the lever is actuated the side wings will be correspondingly raised or lowered.

5. In an animal stock, the combination, with movable side wings, of a breech-

454,501. ANIMAL-STOCK. WILLIAM STENEN, Bremen, Ohio.
Filed Feb 9, 1891. Serial No. 380,799. (No model.)

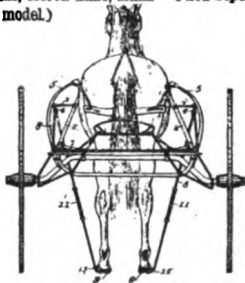


ing-strap for securing the wings together and spring-actuated back-straps carried by one of the wings and having perforations designed to engage projections on the other wing.

6. In an animal-stock, the combination, with movable side wings, of spring-actuated back-straps carried by one of the wings and having perforations designed to engage projections on the other wing.

7. An animal-stock having vertically and laterally adjustable side wings, in combination with a ratchet and-pawl mechanism and a series of pulleys carried by each wing and a rope designed to engage each series of pulleys, one end of each of the ropes being secured to the ratchet mechanism and the other end being provided with a clasp.

Claim.—1. In a device **454,885. LEG-SPREADER FOR HORSES. WILLIAM SMITH and THEOPHILUS E. HILLS,** Heron Lake, Minn. Filed Sept. 2, 1890. Serial No. 364,432. (No model.)

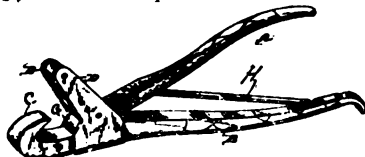


2. A leg-spreader comprising in combination a rigid outwardly-projecting arm arranged upon the vehicle-shaft, an exterior guard upon said shaft extending outside of said arm, and a flexible elastic cord secured to said arm and adapted to be detachably connected to the hind foot of the horse between said shafts, substantially as and for the purposes set forth.

3. In a device of the class described, the combination of the rigid outwardly-projecting arm 3, adjustable lengthwise of the shaft of the vehicle, the strap 14, adapted to be secured between the hoof and its shoe and projecting therefrom, and the elastic cord 8, adapted to connect said arm with said strap, substantially as and for the purposes set forth.

4. In a device of the class described, the combination, with the vehicle, of sheaves having rigid support upon the vehicle-shaft above and outside the hind feet of the horse, and a cord running over said sheaves on opposite sides and to the rear of the horse and adapted to have its ends respectively detachably connected to the hind feet of the horse, substantially as and for the purposes set forth.

454,473. VETERINARY INCISOR-CUTTER. HERMANN HAUSHAMM, Chicago, Ill. Filed June 25, 1889. Serial No. 315,563. (No model.)



Claim.—1. In a veterinary incisor-cutter, the combination, with the cutting-jaw, of a sustaining-jaw and a pivot connecting said jaws forward of the sustaining-jaw being located to the rear of the

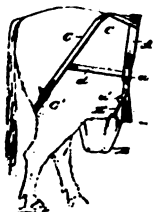
cutting-jaw and to which access is gained between the cutting-jaw and the pivot, whereby the tooth is inserted between the cutting-jaw and the pivot and the outer face thereof is supported by the sustaining-jaw, substantially as described.

2. In a veterinary incisor-cutter, the combination, with the handle B, provided at its forward end with a cutting-jaw, and the lugs D, terminating approximately in a plane parallel with the cutting-jaw and perpendicular to the handle, of the handle A, pivoted at its forward end between said lugs, and a sustaining-jaw, substantially as described.

hung to the other arms of said levers, with a bolt L through said cross-head and connected with the toe-piece, substantially as described.

3. The combination of a toe-piece B, adapted to engage the shoe at the toe, two arms E E, hung to the said toe-piece and extending rearward, their rear ends upturned to engage the shoe upon the outsides at the rear, levers H H, hung, respectively, to the arms E E near their rear ends, one arm of said levers adapted to engage the shoe upon the insides, opposed to the engagement of the arms upon the outsides of the shoe, a cross-head J, hung to the other arms of the said levers, with a bolt through said cross-head and connected with the toe-piece, and the hole through the said cross-head through which the bolt passes, enlarged from the outside inward to permit the rocking movement of the cross-head on the bolt, substantially as described.

455,618. CALF-WEANER AND UDDER-PROTECTOR. THOMAS M. HELL, Milford, Mo. Filed Jan. 3, 1891. Serial No. 378,618. (No model.)



Claim.—1. In combination with a pouch B having attached to one side thereof a snap-hook

E and adjacent to the opposite side of the pouch a strap A and straps C C, the strap A having a ring with which the snap-hook engages, and straps C C attached to the strap A and adapted to engage with the straps C C, substantially as shown, and for the purpose set forth.

2. In an udder-protector, the combination of the flexible connections A, C, and

C C, connected to each other substantially as shown, straps d, connecting the straps A and C C with each other above their points of adjustment, a pouch secured to the strap A, said pouch also having straps C C and a snap-hook on its longer side for engagement with the ring a, and buckles, substantially as set forth.

EDITORIAL DEPARTMENT.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

Annual Meeting at Washington, D. C., September 15th 16th, 17th.

All delegates to the Annual Convention of the United States Veterinary Medical Association will be favored with the $1\frac{1}{3}$ rates of fare at all points in the Trunk Line Association, Central Traffic Association, Southern Passenger Association, and by the Chicago and Alton R. R. of the Western Passenger Association. They must secure certificates at the point of starting and these will be signed by the Association's Secretary at the meeting which will

entitle them to the reduction on the return fare. Further notice will be given as other concessions are granted by other railroads.

The headquarters of the Association will be at Willard's Hotel, where a rate of \$3 per day will be granted to all in attendance. The sessions will be held in Willard's Hall, in the hotel building. Delegates will register their names at once with members of the Reception Committee, who will be in attendance. The Veterinarians of Washington and Baltimore will tender a lunch to the members on the opening day of the Convention and will render all aid and information for the benefit of those in attendance.

In addition to the papers, etc. already announced, the Committee of Arrangements have the pleasure of announcing a paper by Dr. W. L. Williams, of Bloomington, Illinois, on "Rachitis". Several other papers are promised for this meeting, and will be announced at a later date.

A trip to Mount Vernon is under consideration by the Committee.

This meeting of the United States Veterinary Medical Association will attract unusual attention from the World of human Medicine and from others, not only from the important subjects which will be discussed, that of food inspection being of as much interest to the human physician as to the veterinarian, but also from the fact that the *Congress of American Physicians and Surgeons*, and the *Association of American Anatomists* will also meet in Washington the following week, September 23rd, 24th, and 25th.

The sessions of the meeting will be closed on the evening of the 17th, by a banquet at Willard's Hotel.

W. HORACE HOBKINS, *Secretary*.

12 So. 37th St., Phila., Pa.

ANIMAL INTELLIGENCE.

The following cases have been authentically reported to us, or have come under our personal observation.

A five months old black spaniel bitch, was whipped for having torn up a feather duster, she seemed humiliated and disappeared. Shortly afterwards she reappeared with a new feather duster, which she had found in a neighboring store, and and her restored gaiety seemed to indicate, that she thought that in bringing the stolen article she had repaired all harm which she had done, and for which she recognized that she had been punished.

A Collie Bitch, four years old, who had never been further from home than a neighboring market town, was given to a purchaser of some cattle, and sent with the latter by railroad a distance of some seventy miles; on arrival she escaped and returned to her original home in three days.

A Collie, of the same family, was on the porch of the farm house at 11 A. M., when the farmer told his boy, that the cows had broken the fence and were in a meadow pasture, three quarters of a mile away and instructed him to go drive them in. An hour later, at dinner, the boy said he had forgotten to go for the cows and on leaving the house found the collie driving them to the stable. In this case the conversation was entirely between farmer and boy, and no word was addressed to the dog.

A Fox Terrier Bitch of our own, which had been raised from a puppy in the house, was given away three years ago and only seen from time to time. She formed a close attachment to her new master, but never forgot us. We had only seen her once in the last year, in December, but in July went to the country for a day, when she showed unbounded delight. At bed time she flew past her present master's room, her ordinary sleeping place, and was on the bed frantic with joy, until her old master had his head on the pillows, when she curled close to his neck as she always did in her early years, perfectly content.

ED.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEONARD PEARSON, B. S., V. M. D.

INFLAMMATION OF THE UDDER OF A COW.

Veterinarian Thum.—Thalmassing.

Thum was called to see a cow, which he found to have a swelling of the udder, that extended from the navel to the perineum. The swelling of the udder itself was hard, and sensitive to pressure; that part of the swelling in front and behind the udder was cedematous. The right front quarter was larger than the others, and a light brown fluid, containing cheesy fragments, could be drawn from it through its teat. This discharge did not have a bad odor. The other three teats yielded small quantities of seemingly normal milk.

The owner stated that the cow had given birth to two dead bull calves eight days before this visit, and that the enlargement of the udder had commenced a week before the delivery. With the exception of a little weakness in the hind quarters, the cow's general condition was good. The treatment prescribed consisted of steaming the udder, thorough milking, and the application of the following salve.

R	Acid. Salicy.,	2.5 solut.
	Spirit.,	q. s.
	Adip. Suill.,	50.0 m. fl.

M.

At the next visit, six days later, it was found that the local condition was much worse and the cow would not eat. The udder was so large that it nearly touched the ground; the cedema in front and behind it had increased; the temperature was 40.5° C., and the pulse 120. A point of the right front quarter was found to fluctuate, and through an incision made there eleven litres of yellow fluid were drawn off. Exploration of the cavity revealed the presence of a great quantity of floating shreds of tissue, which could be easily detached and removed. It was found that the cavity of this cyst had no connection with the milk cistern, and hence did not communicate with the outer air.

To this fact was probably due the absence of the micro-organisms of putrefaction and, hence, of bad odor in the cystic contents. Since it was impossible to thoroughly cleanse the cavity of the partly detached tissue with the hand on account of the smallness of the opening, and the fact that dangerous hemorrhage followed an attempt to extend the incision an instrument of the shape of a small hoe, with a handle twenty inches long, was constructed for the purpose. The treatment consisted, now, in removal of the shreds, and injections of the cavity with two to three per cent. solution of creoline. Large masses were brought away each day, for some fourteen days; one day a piece that weighed one and one-half pounds was removed. The cavity was so deep that the twenty-inch-long instrument could be hidden in it. Good healthy granulation commenced a month after the first operation, and in three weeks more the cure was complete. At this time the cow gave nine litres of milk per day, from the three healthy quarters.

It is stated that the owner afterward reported that the cow had been chilled, and an inflammation of the entire udder followed, so that the animal had to be fattened for the butchers. *Wochenschrift für Thierheilkunde, No. 24, 1891.*

VOMITING OF HORSES.

Army Veterinarian—Duvinage.

The view that horses only vomit when the stomach is ruptured is very generally accepted, but the author cites two cases to show that this is not the only cause. Paralysis of the cardiac orifice of the stomach is necessary to vomiting, but this can be caused by the presence of certain chemical substances, by over-filling the stomach or by distention with gas. In the first case cited, the horse showed severe colicky symptoms while at work. The evening before he had eaten his food as usual. Violent retching was followed by the discharge of large quantities of sour-smelling food through the nostrils. With the exception of slight depression the horse had fully recovered by evening. The horse had received hay and green food with his rations, and the supposition is, that the distention of the stomach by gas was the cause of the vomiting.

In the other case the horse vomited at intervals for six hours. The vomiting was accompanied by severe retching and, in the intervals, coughing and depression were marked. The following symptoms were noticed: the visible mucous membranes were

dark red; temperature 39° C.; pulse weak, and seventy-two beats in the minute; artery hard, forty-eight respirations per minute; trembling and tottering; staring expression of the face and peristalsis weak. On the lower third of the neck was a swelling, the size of a fist. The animal died, and the autopsy revealed a mass of food obstructing the duodenum. The stomach was dilated to three times its normal size, by gas; its wall was throughout, intact. A rupture five inches long was found in the left pillar of the diaphragm. The plug in the duodenum was the size of a goose egg; and the stomach contained, besides the gas, a quantity of semi-fluid. Plugs of food were also found in front of the point at which the œsophagus passes through the diaphragm, and on the lower part of the neck.

Duvinaige is of the opinion that the rupture in the diaphragm was due to the pressure exerted, through the stomach, by the abdominal muscles; and that the hemorrhage following the formation of this tear produced the death of the animal.

The writer draws from these cases the conclusion that rupture of the stomach is not necessary to vomiting in the horse. *Berliner Thierarz. Wochs. No. 17, 1891.*

TREATMENT OF MALIGNANT TUMORS.

Professor von Mosetig.

Prof. v. Mosetig gave his experience in treating malignant growths, with injections of various kinds, at a recent meeting of the Vienna Medical Society. He has experimented with drugs of all sorts, including lactic acid; but, until he tried aniline coloring matters, with unsatisfactory results; it occurred to him that since the cells making up the tumors have less vital resistance than those of sound tissue, a dye that would stain their nuclei would probably destroy them, and not injure those of healthy tissue. An experiment in which he made injections of a solution of arsenic-free, aniline dye into a sarcoma, gave a favorable result. Now that pyoctamcin has come into such prominence, Prof. von Mosetig has tried injections of one five-hundredth and one three-hundredth of this substance each second or third day, directly with the tumor. He has found that sarcomas treated in this way do not disintegrate but dry up and contract upon themselves. Prof. von Mosetig is still experimenting and hopes to find a still more rapidly-acting substance.

Prof. Billroth gave as his opinion, that malignant tumors could be destroyed in this way. *Allg. Wiener Med. Ztg.*, No. 5, 1891.

PROLAPSUS OF THE UTERUS FOLLOWING ABORTION.

Army Veterinarian Wassersleben.

A mare aborted an eight month's colt, and twenty-four hours later a prolapsus took place. A subcutaneous injection of morphia was at once made, the womb washed with a solution of creoline, and returned. The mare was now placed in a stall, in which her hind feet were considerably higher than the front, in order to stop the pressing, but without success, as the uterus was repeatedly forced out. The patient was then taken into the riding-ring and walked, while the arm of the operator was kept in the vagina, as a truss. The pressing soon stopped, so that the arm could be removed; but, in a quarter of an hour, commenced again so that the prolapsus again occurred. A dose of 30.0 gms. of chloral was then given and, as it had no effect in an half an hour another dose of the same size was given. This did not entirely stop the pressing, but checked it. The uterus now hung down fully twenty inches, was blue in spots and the lower one swollen to the size of a child's head; it was washed again with creoline solution and replaced. The mare was now walked for two hours and given no time to stop to press, and the prolapsus did not occur again. The subsequent treatment consisted in injections of one two-thousandth solution of corrosive sublimate, and in one week the mare was put to work. *Zeitsch für Vet. Kund.*, No. 2, 1891.

FACIAL PARALYSIS.

Army Veterinarian Reinke observed a case in which both facial nerves were paralyzed. This was shown by the flacid hanging of the lips, inability of the horse to move them, difficulty in the prehension of food and in chewing. The affection recovered under the subcutaneous injection at first of veratrin, and afterwards of strychnine (0.1 gram each third day).

SODIUM CHLORIDE AS A THERAPEUTIC AGENT.

The use of a solution of sodium chloride subcutaneously in the treatment of hernia was mentioned in the June number of this journal. It was recommended by Imminger, a German veterina-

rian. Luton and Lenormand in *La Presse Vet.* now commend it in umbilical hernia. Their method is to inject, with a hypodermic syringe, a small quantity of a saturated solution of common salt, under the skin on each side of the rupture. On the following day there is a marked oedematous swelling which disappears gradually in some five days. At the end of this time the swelling is no larger than a dollar, and complete recovery soon results. *Berl. Thierärz. Wochs.*, No. 26, 1891.

THE ITALIAN LAWS FOR THE SANITARY CONTROL OF THE MEAT AND MILK SUPPLIES.

A law under this title was given out August 3, 1890, which might serve as a model for all regulations of this sort. The thoroughness of this law reflects great credit upon those who drew it up. All the precautions that modern investigation have shown to be desirable have been observed. In regard to the meat supply the provisions are for: 1st, The compulsory examination of all butcher animals; 2nd, The erection of public slaughter-houses in all cities of over six thousand inhabitants; 3rd, The conferring upon veterinarians the direction and supervision of these slaughter houses; 4th, The sale of poor quality, but not unhealthy meat, apart from the prime sorts; 6th, Strict rules for the inspection of imported meats.

The rules regulating the milk supply are fully as excellent and thorough. They provide for: 1st, The licensing of every dairy; The examination, by a veterinarian, of every cow before she is allowed to enter the dairy; 3rd, The compulsory reporting of each case of sickness among the cows of the dairies; 4th, The regulation of the sale of the milk from sick cows; 5th, The closing of dairies upon the breaking out of an epidemic. *Zeits. für Fleisch und Milch hygiene*, No. 10, 1891.

Laws of this sort are not peculiar to Italy, but fully as stringent regulations exist in France and Germany, besides many of the smaller countries of Europe. They are not made, as one writer has declared, to give the law makers and officers something to do, but because investigation has shown that many diseases are caused by the consumption of impure and diseased food of these classes, and because experience has shown the satisfactory effects of a well-regulated meat and milk inspection. Regulations of this class are, each year, becoming stricter in all parts of

Europe. In Saxony, for example, it is expected that laws will soon be adopted providing for the compulsory examination of every butcher animal killed, in town or in the country, by an expert. At the present time it is required that thirty-six microscopical examinations be examined for trichinea from every hog that is killed in the kingdom. England is the last of the European countries to take up this question, but from the energy with which it is now being discussed, there can remain but little doubt that she will fall in line and soon adopt similar laws. In this case the United States will be the last, and only one, of the highly civilized countries without a regulated meat inspection; and this in the face of the fact that she is the greatest beef and pork producing country in the world! When the nations that should be our greatest buyers are so stringent in regard to their own home-raised products we can not be so imprudent as to ask that they accept foreign goods without a clean and authentic certificate of health. Meat inspection—careful, thorough meat inspection—must eventually come in the United States, and the sooner this time comes the better it will be for our foreign trade—for our shippers and producers.

ENGLISH.

THE ETIOLOGY OF TETANUS.

It is now six years since Nicolaier discovered that by inoculating with soil from various sources he could produce typical and fatal tetanus in mice, guinea-pigs, and rodents, and that the seat of inoculation contained in such cases a bacillus with well-defined morphological characters. Subsequent investigation by a large number of observers showed that this same organism is to be found in the pus of the wound in cases of traumatic tetanus of man and the horse, and, although the strict proof that Nicolaier's bacillus is the actual cause of tetanus had not until quite recently been led, there has not for some years past been any doubt on the matter in the minds of most bacteriologists.

If tetanus, quite as much as anthrax or glanders, is a disease caused by the introduction of a micro-organism into the animal body, it is imperatively necessary that the fact should be brought home to human and veterinary practitioners, for an accurate knowledge of the cause of a disease nearly always points to the means of prevention and sometimes also of cure. To veterinary surgeons hitherto the causation of tetanus has generally been regarded as an inscrutable mystery, but, thanks to the researches

of bacteriologists, there is no longer anything mysterious about it, as we hope in this article to show.

It has been already indicated that the bacillus discovered by Nicolaier has on many occasions been found cases of natural tetanus; but when it was desired to furnish the experimental evidence necessary to place the etiological rôle of the organism beyond any doubt or cavil, considerable difficulty was experienced. To do this it was necessary (1) to cultivate the bacillus in a state of purity outside the animal body, and (2) to re-produce tetanus by inoculating animals with such pure cultures. The difficulty in connection with the first of these steps arose from the fact that the wound which has served as a port of entrance for the tetanus bacillus in cases of traumatic tetanus (natural or experimental) never contains that organism in a state of purity, and, as many of these associated organisms grow in ordinary culture media much more readily than the tetanus organism, the isolation of the latter is not easily effected. But as Kitasato has shown, the tetanus bacillus has two characters by taking advantage of which pure cultures may be obtained from pus containing a variety of other organisms. The first of these is, that it is anærobic, and can therefore be cultivated in media from which oxygen is absolutely excluded. Hence, when a *bouillon* culture inoculated with pus containing a variety of organism besides the tetanus bacillus is incubated in an atmosphere of hydrogen, or *in vacuo*, such organisms as are ærobic do not develop, and a culture is thus obtained containing only the tetanus bacillus and, it may be, one or two other anærobes that were accidentally present along with it in the pus. The second property of which advantage is taken is that of forming spores. The tetanus bacilli after a few days' incubation form spores, which, like the well-known anthrax spores, are vastly more resistant towards heat than the spore-free bacilli, or other organisms in which spore formation does not take place. Accordingly, when a mixed culture obtained by incubation *in vacuo* is heated in a closed vessel for six hours at a temperature of 80° C., the spores of the tetanus bacilli retain their vitality, while all non-sporulating accidental organisms present are killed.

By proceeding in the manner above sketched, Kitasato, Vaillard, Vincent, and others have obtained pure cultures of the tetanus bacillus, and have cultivated them through many successive generations. In such cultures the organism presents itself at first in the form of longer or shorter slender rods, or

occasionally as filaments, and in this phase of its development the organ is mobile. At a later stage sporulating bacilli make their appearance; these are slender rods provided at one end with a round refractile spore, which is three or four times as broad as the rod carrying it. A sporulating bacillus thus acquires a striking resemblance to a pin.

We now come to the interesting point of inquiring what effects are produced by inoculation with pure cultures of the tetanus bacillus, and what follows upon that head we condense from a recent article by MM. Vaillard and Vincent,* to whom is due the credit of having cleared up some of the most obscure points in connection with the experimental pathology of tetanus.

The animals found to be most sensible to inoculation with cultures of the tetanus bacillus are white mice, rats, and guinea-pigs; rabbits are also susceptible, but to a less degree, and the dog is very resistant. An extremely small dose of a culture in *bouillon* (1-500 of a cubic centimetre) is sufficient to give typical tetanus to a mouse or a guinea-pig, the symptoms setting in after 12-20 hours, and death resulting in 36-40 hours after inoculation. The rabbit requires considerably larger doses, and the period of incubation is longer and the subsequent course of the disease less rapid. The inoculation succeeds whether the culture be injected under the skin or *dura mater*, or into the muscles or veins, but infection does not take place by way of the alimentary tract. A guinea-pig can be infected by allowing a few drops of culture to fall on a cutaneous wound on the back, even when that is of small extent and does not intersect more than the superficial layers of the dermis. The symptoms are more or less acute according to the resistance of the animal or the strength of the virus, and actual recovery may take place after 30 days' illness. The symptoms vary also according to the seat of inoculation; the muscles nearest the point at which the culture is introduced first become tetanic, and then the symptoms extend to the adjacent limbs, and finally become generalised.

Post-mortem examination of animals killed by inoculation with cultures of the tetanus bacillus reveals only insignificant lesions, such as slight hypæmia or œdema of the subcutaneous tissue, and congestion of the viscera, due to the impeded respiration before death. Moreover, even when death supervenes within 26 hours microscopic examination rarely reveals any bacilli

at the seat of inoculation or elsewhere in the blood or tissues, and this fact is in agreement with what is found to be the case in tetanus occurring naturally (non-experiment) in man and animals.

These facts had been previously ascertained by Kitasato, but it remained for MM. Vaillard and Vincent to point out their correct interpretation. The symptoms which follow inoculation with pure cultures of tetanus bacilli are not due to the growth and multiplication of the bacilli within the body, but solely to a toxic substance or substances contained in the culture at the time of inoculation. The result is thus entirely different from what follows when an animal is infected with a culture of the anthrax bacillus. That this is so is indicated already by the fact that tetanus bacilli are not, or only with difficulty, to be found in the bodies of the animals that have died with the tetanic symptoms, and the complete proof has been furnished by MM. Vaillard and Vincent, who have shown that the same results are obtainable with cultures from which the bacilli have been removed by filtration, and furthermore, that tetanus bacilli or spores when freed from their own toxic products by washing are incapable of producing tetanic symptoms, provided they are inoculated in a state of purity into a healthy tissue.

Last, but not least, MM. Vaillard and Vincent have shown that while the tetanus organism is not pathogenic when inoculated in a state of purity, there are certain circumstances in which it acquires the power to multiply in the animal tissues, and there to generate those toxic substances to the action of which the tetanic symptoms are immediately ascribable. Thus they found that when one inoculates in a guinea-pig $\frac{1}{4}$ - $\frac{1}{3}$ of a cubic centimetre of a liquid rich in bacilli and spores, but free from toxin (the tetanising substance generated in cultures of the bacillus), the animal does not take tetanus; but if to 1-15 of a cubic centimetre of such a liquid one adds $\frac{1}{4}$ of a cubic centimetre of a 20 per cent solution of lactic acid, and then injects the whole into the muscles of the thigh, the animal becomes tetanic, the symptoms being exhibited first in the inoculated limb, and then rapidly extending to the other limbs and to the muscles of the neck. The result was the same when the seat of inoculation was injured, not by the injection of lactic acid, but by simple bruising of the part prior to injecting the tetanus germs. Still more interesting from the practical point of view is the discovery that fatal pathogenic properties are conferred upon the tetanus bacilli by inoculating along with them other organisms, or, which comes

to the same thing, by depositing the bacilli in an open wound. Into such a wound the everywhere present organisms of suppuration inevitably find their way, and apparently so injure or lower the vitality of the tissues as to enable the tetanus bacilli to multiply, and to generate the fatal toxin.

The whole of these discoveries are in perfect harmony with what was previously known regarding cases of tetanus occurring naturally in men and animals. The tetanus that follows castration, or that which sets in after pricks of the horse's foot, is now easily explained. The tetanus germs, like the common pyogenic organisms, are widely diffused in nature; and the employment of dirty instruments and the neglect of antiseptic precautions in the after treatment of wounds, afford ample opportunity for the occurrence of that mixed infection to which tetanus is due. As is well known, the wound associated with a case of tetanus need not be large, and it is often so small as to escape detection (idiopathic tetanus); but this point also is quite in harmony with the facts brought to light by the researches of Kitasato, Vaillard, Vincent, and others. The previously mentioned toxin is a substance of almost incredible potency. For example, the last two observers obtained cultures so virulent as to be fatal to guinea-pigs in doses not exceeding the 1-1000 of a cubic centimetre, and, of course, the toxin itself formed only a small fraction of this dose.

The moral of these recent discoveries is evident. The practitioner must mentally place tetanus in the list of micro-organismal affections; and when cases of tetanus supervene after castration or other operation, he must not, as many have hitherto done, ascribe them to atmospheric causes. The strict asepsis obtainable in human surgery is difficult—sometimes impossible—to secure in wounds of the lower animals, but the nearest possible approach to it should always be aimed at; and, above all things, care ought to be taken that, through dirty hands or instruments, the operator is not himself the means of infection.—*The Journal of Comparative Pathology and Therapeutics*, June, 1891.

THE DISCOVERY OF PLEURO-PNEUMONIA IN AMERICAN CATTLE.

Are the lung lesions in contagious pleuro-pneumonia of cattle pathognomonic, or may identical or indistinguishable alterations of lung structure be found in other diseases? This question demands careful consideration, in view of the dispute that has

recently arisen between the home authorities and those of the United States regarding the alleged existence of contagious pleuro-pneumonia in United States cattle landed in this country.

At the present time cattle landed in this country from the United States must within ten days be slaughtered at the port of debarkation. The ground for this restriction regarding the importation of United States cattle is the belief that pleuro-pneumonia exists in that country. There are some agriculturists in this country, and, it goes without saying, many more in the United States, who would like to see this restriction removed. The American Government has for some time past been making efforts to stamp out pleuro-pneumonia, and more than twelve months ago it was contended by the Bureau of Animal Industry that these efforts had been successful in eradicating the disease save in a small area around New York City. Notwithstanding that, the British veterinary inspectors continued to find now and again in the lungs of United States cattle landed in this country, lesions which they pronounced to be those of pleuro-pneumonia. These diseased cattle, it was alleged, came from districts which, according to the information possessed by the Bureau of Animal Industry, were free from pleuro-pneumonia.

Two possible explanations of this state of affairs suggested itself: (1) that pleuro-pneumonia might exist in the United States in districts officially regarded as free from the disease, or (2) that the British veterinary inspectors had made a mistake in diagnosis. In order to discover which of these explanations was the correct one, the American Department of Agriculture obtained permission from the British Government to station American veterinary surgeons at the principal seats of slaughter of American cattle in this country, and forthwith three American inspectors took up their residence in London, Liverpool and Glasgow. These officials are charged with the duty of examining the lungs in all cases in which pleuro-pneumonia, or supposed pleuro-pneumonia, is found in American cattle, and by a system of marking and registration they are also supposed to be able to discover the district from which any such diseased animal has been exported.

In the month of April last, some of the animals belonging to a cargo of American cattle landed at Dampford were found after slaughter to present lesions which the British veterinary inspector considered to be those of contagious pleuro-pneumonia. The correctness of this diagnosis was confirmed by the veterinary

advisers of the Board of Agriculture in London, but Veterinary Surgeon Wray, the American inspector stationed in London, disputed the accuracy of the diagnosis, and maintained that the lesions in question were not those of pleuro-pneumonia. Portions of diseased lung from one of these animals were submitted to Professors Walley and M'Fadyean, and their opinion was in consonance with that of the home authorities.

In these circumstances, Dr. Wray brought portions of the same lungs to Edinburgh, in order to obtain the opinion of Professor Williams, and, according to information supplied to some of the lay papers, that authority not alone supported the view taken by the American official, but also went so far as to say that the lesions were simply those of broncho-pneumonia, and expressed his "willingness to demonstrate to any body of veterinary practitioners the distinctive features of broncho-pneumonia detected in these American lungs, as distinguished from the characteristic lesions of contagious pleuro."

We understand that portions of these diseased lungs have also been forwarded by the American inspector to the official head of his department in the United States, and some interest will be felt in the attitude taken up in that quarter.

It has, we believe, been generally held in this country that the *post-mortem* diagnosis of contagious pleuro-pneumonia is not a matter of great difficulty to anyone who has had much experience of the disease, that, in fact, an identical pathological picture is never met with any other affection; and it is hardly possible to conceive an explanation of the flagrant difference of opinion that has arisen regarding the present case. If Professor Brown and his assistants at the Board of Agriculture do not know pleuro-pneumonia when they see it, it cannot be from lack of experience; and since the American inspectors were stationed in this country in order to control the diagnosis of the British inspectors, it must be concluded that they were selected from those who had had abundant opportunity to make themselves acquainted with the pathology of pleuro-pneumonia.

It is within the range of possibility that on American soil there exist other bovine diseases having lesions not distinguishable from those of contagious pleuro-pneumonia, and something to this effect was said not long ago by Dr. Salmon, the veterinary adviser to the United States Government. At the Annual Meeting of the United States Veterinary Medical Association, held in Chicago in September last, Dr. Salmon explained the

grounds upon which it had been deemed advisable to station American inspectors in this country ; and as his statement is in several respects interesting, it may be worth while to quote it here at length. He said, "It seemed very desirable that our Government should have these men there to look after the matter for two reasons :—First, there was a possibility that there had been an error in diagnosis. Those who have had experience with pleuro-pneumonia know how difficult it is to make a diagnosis when you have only one of these animals, and no way of tracing the history of that animal. You may find the condition of the lungs which resembles pleuro-pneumonia, but which also resembles other diseases. We all know that pleuro-pneumonia produces a peculiar effect on the appearance of the affected lungs ; but these peculiarities are also found in lungs which have received their irritation from other germs and sometimes by other agents. So that it can hardly be claimed to-day that these symptoms are always those of contagious pleuro-pneumonia. Of course, when you take these symptoms of pleuro-pneumonia and couple them with other characteristics which we generally see, then we begin to have very positive evidence of the diagnosis."*

We need hardly say that we do not quote this passage in order to show what are Dr. Salmon's views regarding the morbid anatomy of pleuro-pneumonia, for if he had any intention of explaining how his subordinates sent over to Great Britain were to distinguish pleuro-pneumonia from other diseases with which British veterinary surgeons had confounded it, his effort was singularly unsuccessful. One thing is made clear, however, viz , that Dr. Salmon considers it difficult to diagnose a case of pleuro-pneumonia, unless the history of the animal is known, and this of course must refer to *post-mortem* diagnosis. We do not share that opinion, and we do not find in the action of Dr. Wray any evidence that he shares it. Be it observed, Dr. Wray did not say with reference to the lungs of the Deptford cattle—"These lesions resemble those of pleuro-pneumonia, but they may be due to something else, and unless you know the history of the animals you have no right to pronounce the disease pleuro-pneumonia ;" on the contrary, he appears to have experienced no difficulty in deciding that the lesions were *not* those of pleuro-pneumonia.

* Journal of Comparative Medicine and Veterinary Archives, November, 1890, p. 664.

In other words Dr. Wray carries in his mind's eye a picture of what he takes to be a lesion of a pleuro-pneumonic lung, and he did not find it in this case. In the same way, Prof. Brown, Mr. Cope, and the other veterinary officers of the Board of Agriculture also carry with them a mental picture of the appearances of such a lung, and that picture is different from Dr. Wray's. Both cannot be right, and until the American authorities condescend to define those other diseases vaguely alluded to by Dr. Salmon as having lesions analogous to contagious pleuro-pneumonia, they can hardly expect that when British veterinary inspectors in this country encounter in American cattle "the condition of lungs which resembles pleuro-pneumonia, or which also resembles other diseases," they will pass it over, because it may not have been pleuro-pneumonia. In short, if there is a doubt—and probably there was none in this case—home interests must get the best of it.—*The Journal of Comparative Pathology and Therapeutics*. June, 1891.

SOCIETY PROCEEDINGS.

Massachusetts Veterinary Association.—The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, June 24th, 1891. President L. H. Howard in the chair. Members present: Drs. Beckett, Blackwood, Emerson, Haddock, Howard, Marshall, Winslow and the Secretary. Honorary Member Dr. Stickney.

Minutes of the previous meeting read and accepted.

Unfinished business. The Secretary reported having seen President Goodell, of the Mass. Agricultural College, at Amherst, at commencement, with reference to the appointment of a veterinary scientist upon the staff of the State Experiment Station. Dr. Winchester had also talked with President Goodell about it at the same time. Both President Goodell and Professor Goessmann were in favor of such an appointment, and the Board of Control, of the Experiment Station, at the annual meeting, held at Amherst, June 9th, had appointed a committee, consisting of President Goodell and Secretary Sessions, of the State Board of Agriculture, to meet a similar committee from the Massachusetts Veterinary Association, to discuss the proper steps to be taken toward the establishment of a veterinary department at the State Experiment Station.

Dr. Stickney spoke in favor of the Association's taking action to bring about such a state of affairs. Dr. Blackwood suggested that the chair might appoint a committee to meet the committee from the Board of Control, of the Experiment Station. Dr. Marshall then moved that the chair appoint a committee of two to confer with President Goodell and Secretary Sessions. Seconded by Dr. Blackwood and carried.

The President then named Drs. Winchester and Peters to serve on the committee.

The Secretary then reported that he had taken no steps towards notifying all veterinary graduates in the State of the existence of the Association, or towards having copies of the constitution printed, because he was instructed to notify *all* veterinary graduates, and there were some he thought it would be as well not to notify. And with regard to the constitution, he thought it might be well to modify it by doing away with the clause requiring a thesis from applicants for membership as one of the conditions of admission.

After considerable discussion it was decided that the matter of notifying veterinary graduates of the existence and objects of the Association could safely be left at the discretion of the Secretary.

A request in writing was then filed with the Secretary that Article II, section *a*, of the constitution, be amended so that section *a* of said Article be rendered inoperative for a period of two years from April, 1891, i.e., that the thesis as a requirement for admission be not called for during the period named.

Under the provisions of the constitution governing amendments no action can be taken until the next regular meeting, which does not occur until September.

New business: The work done at the session of the Legislature, just adjourned, for recognition and advancement of veterinary science, by one of its members, Mr. F. H. Appleton, of Peabody, was then brought up.

Dr. Marshall moved that the Secretary be instructed to extend a formal vote of thanks from the Massachusetts Veterinary Association to Francis H. Appleton, Esq., for the kind and friendly interest he had shown in the welfare of a hitherto rather neglected profession.

Seconded by Dr. Hadcock. Carried unanimously.

Meeting then adjourned.

AUSTIN PETERS, *Secretary.*

COMMUNICATIONS.

OSTEO POROSIS.

*To the Editor of THE JOURNAL OF COMPARATIVE MEDICINE
AND VETERINARY ARCHIVES.*

Dear Sir :

I read with interest, an article by V. G. Hunt, in the July number of the Journal, on osteo porosis, which I understand as a criticism on an article written by me upon that subject. He states that the article is full of errors, and entirely misleading as to the pathology of the disease. As he has seen fit to expose my errors, of course, I am accorded the same privilege to show wherein he has erred.

In the first place, I think Mr. Hunt must not have read my article very closely, for he certainly did read it very misunderstandingly ; as he states that I claim the disease does not admit of successful treatment, and that, nevertheless, I admit that a quack friend of mine does accomplish a cure. Now, I think that in my article I made it plain to any person of ordinary powers of understanding that my article was simply a corroboration of the views of Dr. Bern, expressed by him, in an excellent paper published in the December number ; with a few exceptions, and the principal one was, that I disagreed with Dr. Bern as to the treatment, as he says that with our present knowledge of the disease, it would be folly to attempt to treat it ; while I do most certainly believe that it is amenable to treatment in certain stages of its course, and I do not think it would be folly to attempt it, for the same reason that I think it was not folly to attempt the treatment of smallpox a hundred years ago.

Now, as for my quack acquaintance, as Dr. Hunt chose to express it, is concerned, the gentleman referred to by me is a man of intelligence who has been a large stock raiser here for a number of years before this part of the country had the advantages of veterinarians, so was compelled for his own interest to overcome the disadvantage of losing valuable animals by the very prevalent disease, osteo porosis ; and, by reading the best works at his disposal, together with experimenting for a number of years, he found a course of treatment which seemed to benefit, and I, for

one, am always ready to take a suggestion which I consider will be of service to me in my profession, and at least give it a trial, whether it be from a quack or a negro stable hand. But, if Dr. Hunt will take trouble to inquire into the meaning of the word quack, he will find that it means a pretender, and the gentleman I refer to, does not pretend to be a specialist in treating "big head," nor does he affirm in anything that he cannot substantiate. I think we are all liable to commit errors, but before we should attempt to correct, we should be sure that we are in the right, and not jump at conclusions too quickly.

The gentleman asserts that, fifty years ago the disease was well understood, that every farmer could diagnose and in many cases so far cure it as to render the animal useful for a number of years. Now, if this be the case, it is strange to me that among our best authors of the present day no successful course of treatment is laid out.

He says that in certain parts of the West the disease is rare, and that the clod-hopping veterinarians of these sections find no trouble in *fixing them up*. If the doctor means by fixing up, that they cure or put into condition to be of service, I would be greatly obliged to him, if he will acquaint me with those *clod-hoppers'* modes of treatment, as I have great trouble to "fix up" many of the cases which I meet with.

Dr. Hunt says: But as the nature and courses of the ailment came to be understood, etc. . . . Can I ask him to be kind enough to give us the nature and causes of osteo porosis. I would thank him very much for it, so would many of us who are and have been laboring for a number of years, and have as yet only arrived at suppositions which we consider as a first step towards the study of the *etiology* of osteo porosis.

It is supposed that a change of diet is to a certain degree a prophylactic measure; but, as the doctor agrees with me that the disease is more common in malarial regions, is not the decrease in number, in some parts, due to better drainage of our country, as is the case in malaria in the human family? and I consider from the fact of its malarial origin, that it is of infectious origin. I find a change of climate a great step toward the successful treatment of the disease; this again, I will advance as another reason for my theory of it being malarious.

The amenability to treatment that the doctor speaks of may be due to a lower type of infection brought about by better surrounding, as the country is being drained.

The statement, now, when they do occur are amenable to treatment—is, in my mind too extended. If I understand it correctly, when the fire is not too far advanced, *in well constructed* buildings (improved dict) we can extinguish it. If this is a fact, the greatest step towards the cure of osteo porosis is an early diagnosis. Easy to some, difficult to others: myself for one; I acknowledge my incapability to differentiate osteo porosis in its early stage, from rheumatism, and any instruction on the subject will be gladly received.

Facts are certainly more or less wanting to prove the disease contagious, due to germs, etc.; but, are they less wanting to prove the contrary?

Allow me to say a few words about a case that had been under my observation, and which I think proves the inefficiency of the diet, as prophylactic measure.

Mr. M., owns ten valuable horses, mares, colts—every one of which receives the very best of care and food: and twice a week bone phosphate preparation is given them in the feed, with the idea that it will strengthen the bony structures. Last November I was called to examine a colt one year old, and found him affected with osteo porosis. Now, to be short, I can find but one cause in this case: the stables are situated in a very malarial district.

In conclusion I would like to say a few words concerning the pathology of osteo porosis, but it is useless to me to take any more of your valuable space, and I can only refer to my article in June, 1891, and also to page 714, December, 1890, *THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES*; in which Dr. Berns gives us, in my opinion, as much information concerning it, as any one who has written upon the subject.

The treatment of the disease is very uncertain, but in all *fixed up* cases I know of, the change of hygienic conditions, as removal to higher country early and thorough stimulation of the affected parts, good feeding, tonics, alteratives, a run at grass, in short, good attention have been of great advantage.

One opinion of Dr. Berns, I also wish to strengthen: The disease, I think, may be transmitted from sire or dam to offspring as I know of a stallion so affected; and the disease has developed in two of his colts (one died, the other developed lately). This one proof is not, however, sufficient to make it conclusive, but let us hope that the future will bring us more conclusive proofs as to

the etiology of the disease, and that we will again hear, through the medium of your valuable Journal, of some practical facts that may be of service to us in the study of osteo porosis.

We want practical facts and not a series of comparisons, which are very spiritual indeed, but, take up too much space and valuable time.

Yours very respectfully,

A. JASME, V. S.,
Savannah, Ga.

REVIEWS.

A MANUAL OF THE DISEASES OF THE CAMEL, AND OF HIS MANAGEMENT AND USES. By John Henry Steel, V.S., A.V.D., F.R.C.V.S., F.C.S., Fellow of the University of Bombay, Principal and Professor of Veterinary Science, Bombay Veterinary College, Etc. Illustrated. Madras : G. W. Taylor. 1890.

This interesting work on the camel by Dr. Steel, of Bombay, possesses not only the value that attaches to a well written scientific monograph on a subject of the highest importance, but is especially serviceable to those who superintend the practical working of zoological collections, for the reason that it dispels many prevalent and pernicious impressions concerning the uses and management of the strange animal. To the denizen of the desert he is an undeniable blessing—he is no less dear than the barb of Araby, the idol of the Eastern household—and he is cared for with the utmost solicitude ; nor need we not wonder at this, because in the hands of his wild and untutored master he is managed with that success which unlimited experience has furnished, and hence is the very ideal of a beast of transport. For them he is the true ship of the desert ; and to his docility, sagacity, and inexhaustible patience whole families owe their lives amid the burning sands of the desert. A simple lariat guides his steps, he quickly heeds the voice of his master, and gives timely admonition of the impending storm ; but, in the hands of the ordinary British soldier who can be taught nothing beyond what the guard-house has drilled into him, the camel is altogether a different animal. In the Soudan and Afghanistan he has proved a dismal failure as a transport because he was handled by those who knew little or nothing about his habits, his necessities, his power of endurance, and his weak points. Under the impression that he contains within him a perennial well-spring of pure water he has been allowed to go for weeks without water, on forced marches, till he dropped by the wayside, dying of thirst. The camel is not a tank ; moreover, his ignorant and cruel army-masters scarcely ever think of grooming him or removing from his sore and festered back at night, after a wearisome march under a broiling

sun, the galling pack-saddles. It is no wonder that such men complain of the camel as a vicious and irritable brute, mangy and malodorous.

The services of the camel have been, to a great extent, superseded in Asiatic Russia by railroads; but on the other hand, he has been lately introduced into countries that had not known him before, and here he is highly prized. Satisfactory experiments, made by the U. S. Government, have proved that the two-humped camel can be made to render excellent services in the warm climate of the Southern states. Quite a number of them are at present employed in the South for ordinary transportation purposes, and there can be no doubt that he will prove wonderfully valuable in helping to open up the interior of Australia. An atmosphere laden with humidity is not a favorable condition for camel life and, in selecting localities for his services, this fact should be borne in mind. Hence the dry interior of sandy regions like the Central Asian desert are best suited for the exhibition of his powers, as a beast of burden. His whole anatomical structure clearly proves his fitness for a life on the sandy plains; he possesses wonderful endurance, and this quality is inestimable when we consider the conditions under which the services of the camel are called in action. Dr. Steel insists that in respect to this quality, Col. Burnaby was greatly mistaken when he spoke of the camel as "very delicate beast of burden". The fact that he is prone to disease is but an expression of the harsh treatment to which he is frequently subjected, and the little cure that is bestowed upon him when suffering. In point of endurance he is even superior to the mule, with which animal he is an unwilling competitor as a transport. He possesses the same amplitude of chest and the same narrowness of belly—conditions obviously favorable to wind and untiring effort; and then he even surpasses the mule's celebrated congener that feeds on thistles, by the ease with which he stows away hard prickly plants like cactus leaves: but it is his long limbs and spreading foot pads that especially render the camel an ideal beast of burden and of transport. It is for this reason that Gen. Wolseley recommends that camels be first sent over a designated line of march that they may consolidate the soft and slippery soil by a packing process.

Notwithstanding the popular belief that the camel can endure thirst for an indefinite period, still it is important that he be watered once every twenty-four or forty-eight hours, as the privation of water for a longer time cannot but prove injurious. This is so well understood by the Arab-master of the camel that he will water his beast daily except when about to undertake an unusually long journey, and then he prepares him for a protracted thirst by forcing five or six additional gallons of water down his throat. It is previous to such long journeys through the desert that every precaution should be taken in order to ensure satisfactory service, and the failure of the camel to furnish such results when employed as an army transport by the British government in the East, has been entirely due to the neglect of such precautionary measures as Arabian experience has proved to be indispensable.

Dr. Steel dwells on the principal feature of preparation for long journeys at length, and gives such directions in a straightforward and practical manner that there can be no excuse henceforth for throwing the blame of

failure on the poor patient Bactrian. According to Dr. Steel efficient grooming is one of the most important preliminary steps to a long journey and the one which is most frequently neglected. This accomplished, a thorough inspection of every part of the body should be made and a satisfactory condition of the feet should be especially ascertained. Important directions, too, are given concerning the manner of loading the camel, the character and make-up of the *Pulân* or pack-saddle, and its proper method of adjustment. The full understanding of these details is especially important at the present time, when the field of service of the camel is being greatly enlarged and embraces a portion of the United States.

Here and in Australia the study of Dr. Steel's monograph cannot but turn out to be of the highest practical utility. The chapter entitled "General Consideration on Diseases of the Camel" furnishes the key to the special pathology of the bacterian family and is replete with valuable information. From a perusal of this chapter it will be gathered that the majority of cameline diseases are the result of mal-treatment and neglect. The exceeding prevalence of abscesses and the marked tendency of wounds to suppurate is plainly the result of such a cause. Though the natives know better how to handle a camel when in good health than the average European; it is lamentable true that the poor beast could fall into no worse hands when disease becomes his lot. Then the most absurd measures are employed by these rude pathologists of the wilds, and death speedily follows sickness. Consequently, cameline therapeutics and *matéria medica* offer a wide field for much needed observation and experience, and what Dr. Steel submits to his reader's attention in this respect is of great practical interest. One of the most fatal disorders from which the camel suffers is Anthrax, and hundreds perish from this disease annually. Unfortunately it is a most intractable malady, though Dr. Steel offers some rational suggestions as to the best method of treating it. He recommends especially that Pasteur's system of Anthrax-inoculation be enforced by State governments, and so an effort be made to stamp it out.

Though cameline pathology and therapeutics may be said to be still in their infancy, Dr. Steel has proved a valuable pioneer in a new and more enlightened order of things and a careful study of his work should be made by all those interested in the subject.

C. M. O'L.

VETERINARY POST-MORTEM EXAMINATIONS, by *A. W. Clement, V. S.*
Published by Sabiston and Murray, New York.

Autopsies upon the lower animals are frequently made, but the reports thereon are often far from lucid. A lack of system is evident at first glance in many of them. A guide in making these post-mortem examinations based on a system of dissection which shall point out the anatomical variations among the animals and the differences between them and man, is what every Veterinarian needs and he will find it in this little book.

He will also find the best methods of recording the autopsies, and some cases by the author introduced to illustrate these methods and which are of themselves of much interest. The book contains many valuable illustrations.

W. A. C.

BOOKS AND PAMPHLETS RECEIVED.

On the external characters of foetal Reindeer and other notes, by *R. W. Shufeldt, M.D.* Reprinted from the Proceedings of the Academy of Natural Sciences. Philadelphia, 1891.

On the question of Saurognathism of the Pici and other osteological notes upon that groupe, by *R. W. Shufeldt, C.M.Z.S.* Reprinted from the Proceedings of the Zoological Society, London, February 3, 1891.

Beschreibung dreier Mikrocephalen—Gehirne nebst Vorstudien zur Anatomie der Mikrocephalie von *Dr. Felix Marchand, M.A.N.* Halle, 1890.

Journal of the Cincinnati Society of Natural History. April, 1891.

Annual Report American Museum Natural History. New York, 1891.

John Hopkins University Circulars. July, 1891.

Proceedings of the Linnean Society of New South Wales. Vol. v., pt. 4. Sydney, 1890.

Leopoldina amtliches organ der Kaiserlichen Leopoldino-Carolinischen Deutschen Akademie der Naturforscher, edited by *Dr. C. H. Knoblauch.* Halle, 1890.

Il Naturalista Siciliano. Palermo, 1891.

Bollettino Scientifico. Pavia, 1891.

Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino. Vol. vi.

Fauna. Vol. i. Nos. 1—2. Société des Naturalistes Luxembourgeois.

Proceedings and Addresses at a Sanitary Convention, held by Charlevoix, Michigan. Lansing, 1891.

Missouri Agricultural College Experiment Station. Field Experiments with Corn.

Action of Dead Bacteria in the Living Body. By Mitchell Prudden, M. D., and Eugene Hodenpyl, M. D.

UNITED STATES DEPARTMENT OF AGRICULTURE.

What is Forestry? By B. E. Fernow.

Report of the Area of Corn, Potatoes, and Tobacco, and Condition of Growing Crops. July, 1891.

Horticultural and Kindred Subjects. By William Saunders.

HATCH EXPERIMENT STATION OF THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Number 13, Directions for the use of Fungicides and Insecticides.

Number 14, Fertilizers for Corn.

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RECENT EXPERIMENTS WITH MALLEIN—A LYMPH MADE FROM CULTURES OF THE BACILLUS OF GLANDERS.

BY LEONARD PEARSON, B.S., V.M.D.

Hellmann, of the Pasteur Institute, in St. Petersburg, read a paper before a Scientific Society of that city, late in the month of March, in which he described some experiments made by him, with an aqueous extract of potato cultures of the glanders bacillus. He found that subcutaneous injections of 1 c.c. of this fluid, in glanderous horses, was sufficient to cause an elevation of the temperature to 40°C. (104°F.), and higher; weakness, loss of appetite, local reaction at the point of injection and increased discharge from the nose. Injections into healthy horses, or horses suffering from other diseases than glanders, are said to be followed by no reaction. In one or two cases injections in which glanders had not been diagnosed were followed by febrile reactions, but the subsequent autopsies showed the presence of the characteristic nodules of the disease. These experiments were made on cavalry horses of the Russian army.

Hellmann made his Mallein by floating off potato cultures of glanders bacillus with water, adding a little glycerine to the mixture and heating it, at first to 40°C., then to 80°C. and, finally, sterilizing at 150°C.

Dr. Kalmring, in the Veterinary School of Dorpat, Russia, has also extracted a substance from glanders cultures which, when injected into glanderous horses, causes a characteristic febrile reaction, but no effect on healthy animals. Recent dis-

patches from Dorpat report the sad news that Dr. Kalming, in the course of his experiments, infected himself with glanders and has since died from this disease. Before the publication of any of this work I had commenced, the first of March, a series of experiments to determine whether glanders cultures developed a toxine, or toxalbumine, which would have an action similar to that of tuberculine. My Mallein was prepared as follows :

Sterilized glycerine bouillon; made of meat extract, peptone, sodium chloride and glycerine, was inoculated with virulent (second generation) glanders bacilli, from potato cultures, and kept fourteen days in an incubator at 36.5°C . (The bacilli grew luxuriantly.) The cultures were now heated at 80°C . for several hours, to kill the bacilli and condense the fluid; they were next filtered, through Kitasato's porcelain filter, and on three successive days heated, for twenty minutes each time, in moving steam (100°C .). The lymph made in this way is a perfectly clear fluid, a little thicker and darker than the original bouillon. Glanderous and healthy guinea-pigs were injected with doses of 0.25-2.0 c.c. of this substance and the diseased animals showed, without exceptions, both a general and local reaction. The former was shown by depression, loss of appetite and fever; the latter by redness and swelling, both of the inoculation wound and the point of injection. The healthy animals did not react unless the dose was very large.

First experiment.* Male guinea-pig, inoculated with virulent glanders March 13th. Daily rectal temperature of 39.2°C . March 24th, injected in the flank (knee fold) with 0.5 c.c. of the lymph.

Temperature shortly before the injection,	39.2
“ after 4 hours.	39.2
“ “ 7 “	39.4
“ “ 10 “	39.6
“ “ 12 “	39.8
March 25th, A. M..	39.2
“ 26th, “	38.4

Although the animal was almost dead an injection of 0.3 c.c. was made.

After 6 hours,	37.8
“ 10 “	dead

The autopsy showed glanderous processes in the spleen and testicles.

*These tables are also used in an article, by me, on the same subject, in the *Zeitschrift für Veterinärkunde*, Vol. iii. No. 5, 1891.

Second experiment. Male guinea-pig, inoculated March 20. Daily rectal temperature of 39-39.2°C. March 24th, injected 0.25 c.c. of the lymph.

Temperature shortly before the injection, 39.0

" after 4 hours, . . . 39.0

" " 7 " . . . **39.3**

" " 10 " . . . **39.4**

" " 12 " . . . **40.1**

March 25th, A. M., . . . 38.1

" 26th, " . . . 38.9

A second injection of 0.4 c.c. was now made.

Temperature after 6 hours, . . . **39.3**

" " 11 " . . . **39.8**

March 27th, A. M., . . . 39.1

" 28th, " . . . 39.0

Third experiment. Male guinea-pig, inoculated April 16th. Daily rectal temperature 40.0-40.1-40.2°C. April 21st, injected 0.5 c.c.

Temperature after 6 hours, . . . 40.1

" " 9 " . . . **40.6**

" " 12 " . . . **40.5**

April 22d. morning, . . . 40.3

" afternoon, . . . 40.2

" evening, . . . 39.4

April 23d. morning, . . . 38.6

" 24th, . . . 39.1

A second injection of 0.5 c.c. was now made.

Temperature after 6 hours, . . . **39.4**

April 25th, morning, . . . 38.3

" afternoon, . . . dead

The autopsy revealed glanders nodules in the spleen, and glanders bacilli in the blood.

Fourth experiment. Male guinea-pig, inoculated April 16th. Daily temperature 39.6° to 39.7°C.

April 21st., injected 0.5 c.c. Temp. 39.6

" after 6 hours. . . 39.7

" 9 " . . . 39.8

" 12 " . . . **40.2**

CONTROLE EXPERIMENTS.

First experiment. Healthy male guinea-pig, for several days before the injection the temperature ranged from 38.6-38.9°C.

April 21st. Temperature, . . . 38.7

" Injected 0.5 c.c.

Recent Experiments with Mallein.

Temperature after 6 hours,	38.7
" " 9 "	38.6
" " 12 "	38.7
April 22,	38.7
" 23,	39.0
" 24,	39.3
Injected 0.5 c.c.	
Temperature after 6 hours,	38.9
" " 9 "	39.0
April 25th,	39.0

Second experiment. Healthy male guinea-pig. Before the injection the temperature varied between 38.7 and 39.0°C.

April 21st, injected 0.5 c.c. Temp.	39.0
Temperature after 8 hours,	39.0
" " 9 "	38.9
" " 12 "	38.9
April 22d, A. M.,	39.0
" 23d, "	38.9

Third experiment. Healthy male guinea-pig. Temperature before the injection between 38.6-38.8°C.

April 7th, injected 2.0 c.c. Temp.	38.8
Temperature after 8 hours,	39.3
" " 12 "	39.4
" 8th, A. M.,	39.3
" 9th, "	39.3
" 10, "	39.2
" 11, "	39.0

Fourth experiment. Healthy male guinea-pig. Temperature, before the injection, ranged from 38.2 to 38.6°C.

April 2d, injected 2.0 c.c. Temp.	38.2
Temperature after 8 hours,	38.4
" " 12 "	39.0
April 3d, A. M.,	38.5
" 4th, "	38.8
" 5th, "	38.6

These experiments show that the action of mallein on healthy and glanderous guinea-pigs differ. Injections of doses of 0.25 to 0.5 in diseased animals, causes a decided local and general reaction, while these doses in healthy animals produce either no change whatever or at most, a slight redness of the point of injection. Large doses, on the contrary, (2.0 c.c.), cause a transitory fever. The resemblance, in these respects, between mallein and tuberculin is quite noticeable. I could not see, in those cases in which repeated injections were made, that the mallein had the least healing effect on the glanderous process. All of the inoculated

animals died of generalized glanders. To what extent immunity can be produced by mallein is, at present, impossible to say. I shall endeavor to make this an object of further experiment.

The above experiments were made in the Laboratory of the Veterinary School of the Prussian Army, and I wish to use this opportunity to thank its Director, Chief Veterinarian Hall, for his kindness and favors to me during their progress.

Since the above was written an article has appeared in the *Berliner Thierarztliche Wochenschrift* (No. 29, 1891), by Preusse, of Danzig, giving the results of some experiments made by him with mallein. He used a fluid made by extracting potato cultures with equal parts of glycerine and water, and made his experiments on horses. Six glanderous and two healthy horses were injected with doses of from 0.1 to 0.3 c.c.; the former reacted strongly in from six to twelve hours, while the latter showed no change. The reaction was both local and general; the temperature rose, in some cases, to 40.1 and 40.4°C. All of the horses were killed and the post-mortem examinations confirmed the ante-mortem diagnoses in each instance.

It is to be hoped that we will have here a medium for diagnosing glanders, as safe as the tuberculine is for diagnosing tuberculosis of cattle. The latest authentic report shows success in about 98 per cent. of the cases of tuberculosis.

THE UNTRUSTWORTHINESS OF THE REPORTS OF THE GOVERNMENT IN RELATION TO IN- VESTIGATIONS OF ANIMAL DISEASES.

BY FRANK S. BILLINGS, M. D.

Director of the Patho-Biological Laboratory,
State University of Nebraska.

This subject has been once before alluded to in an article published in *THE JOURNAL* by Dr. Spitzka, but I do not think the veterinary profession of this country or the original investigators in patho-biology in the world have any idea how gross are the errors, how absolutely false are many of the statements made in connection with the investigations of animal diseases, especially those of swine in the reports of the United States Department of Agriculture.

It is well known that I have constantly asserted the work of

the Investigators of the Department of Agriculture on Swine Diseases, with the exception of that of Dr. Detmers, as published in the reports from 1880 to 1885, to be *unequivocally false*, and I now make bold to assert that there is no evidence that any actual investigations were ever made, and that all the evidence goes to show that the entire bacteriological material reported during that period was made up out of whole cloth.

THE EVIDENCE.

The "micrococcus" as the specific germ of swine-plague first came into the imagination of the Government Investigators in 1880, that is, it is first reported in that year, and continued until the issue of the report of 1885 (published in the year 1886), when they did not consider a micrococcus to be the cause of all outbreaks of swine-plague. A quotation from the reports of 1883 and 1884 each, will answer all purposes for the whole series; especially is that of 1883 valuable as it has relation to inoculation also, a point in which the government is entirely at fault. From page 57, Report of 1883, I quote the following:

"Our investigations have shown that the plague is a non-recurrent fever, and that the germs might be cultivated; they have even proved that these germs may be made to lose their virulent qualities and produce a mild affection. Surely we have here sufficient evidence to show that a reliable vaccine might be easily prepared, if we carried our investigations but a little way further. If we had such a vaccine, if it were furnished in sufficient quantities and of a reliable strength, if it proved safe in the hands of the farmer, would not our problem be solved? Can we reasonably expect anything more or better for this disease?"

M. Pasteur has recently confirmed our American investigations in a very complete manner. He shows that the disease is produced by a micrococcus, that it is non-recurrent; that the virus may be attenuated and protect from subsequent attacks, and he promises a vaccine by spring.

This should certainly inspire our people with confidence and it should incite our authorities to give the suffering pork-producers the full benefit of these discoveries at the earliest possible moment. There may be objections to vaccination, and I doubt not these are of certain importance; but with hog cholera already distributed over our whole hog-raising territory, these can have but little weight compared with the incalculable benefit that would be conferred by a practicable system of vaccination."

From the Report of 1884, page 221, also:

"In former reports details of experiments have been given which, if correctly stated, demonstrates beyond question that the microbe of swine-plague is a micrococcus. The experiments were made and accounts of them published in advance of those of M. Pasteur's and the evidence furnished was all that could reasonably be required to decide a scientific question of this kind."

My purpose now is to show once for all that the reports of the government have been, and still are, of such a decidedly inconsistent and contradictory character that no statement coming from that source can be taken with any confidence or relied upon unless so fully supported by collateral testimony, that that of the government need not be considered at all. Now what do the above quotations show to the general reader when taken by themselves?

1st. That the germ of swine-plague had been discovered by the government.

2d. That it was a micrococcus. To this assertion the government persistently held until sometime in the spring of 1886—that is, until the report of 1885 was issued.

3d. That tests had been made which warranted the government in promising the farmers that swine-plague could be prevented by inoculation.

4th. That the government found itself justly strengthened because M. Pasteur had confirmed all its work and also promised a virus for preventive inoculation.

Certainly the statements before us bore out exactly those conclusions. Now, as to M. Pasteur, he never saw a case of swine-plague for many years subsequent to 1883—if at all, as it was only discovered in France in 1887, and what is more, for the government, he studied Rouget and not swine-plague, and a “micrococcus” has been shown never to have had any causal connection with Rouget, so Pasteurs’ confirmation was valueless and his promises of a virus also, so far as our American swine-plague is concerned. But we need not go to Pasteur to knock the whole government superstructure into pieces. It has a faculty of manufacturing “Boomerangs” never equalled by the most expert savages.

In the Report of the Department for 1890, (issued May last), may be read :

“The first tests in this direction (for inoculation) were made early in 1886, soon after the hog-cholera bacillus had been discovered.” Now honestly, and in the interests of truth only how can the above passage be made to confirm to the whole testimony contained in the reports from 1881 to 1886?

That the micrococcus was a fraud is self-evident, and never having been the cause of swine-plague it is equally evident that “our investigations (could not) have shown that the germs (micrococci) might be cultivated, or made to lose their virulent qualities and produce a mild affection.”

In fact, nothing was "shown" then and nothing has been "shown" since.

In this JOURNAL, 1888, Vol. ix, page 149. may be read the following words from the government as to inoculation. "*We soon found that there was no indication for attenuating the virus for this purpose, because the strongest virus might be introduced hypodermically with impunity in considerable doses.*"

Now let us witness the government turn a sommersault. "In reducing the virulence or attenuating it, the following method was pursued." "*After the bacteria had been exposed to a high, unfavorable temperature (110°-111°F.) for more than 200 days.*"

Can any mortal human tell what that attenuation was done for in 1890—when in 1888, "the strongest virus could be injected with impunity in considerable doses"?

The reason for all these governmental psychopathological idiosyncrasies is that at every point they have been completely beaten by other investigators.

In a recent letter to the editor of the "*Western Swine-herd*," issue of July 1st., (who asked the government what it knew about inoculation), the government answered in a most peculiar manner. It referred the editor to one of its most gyroscopic productions, and endeavored to kill out the truth, published in the report of 1889, and coolly ignored its report of this year which as frequently contradicted that of 1889 as any of the examples quoted. A quotation from the letter mentioned follows:

"Replying to your third question I would say that I have no means of knowing whether the wide prevalence of swine diseases was or was not due to the dissemination of the disease by the many attempts at prevention by inoculation. *I have no doubt but that the disease may be spread in that way*, and if, as is intimated in your question, there were many attempts made at prevention by inoculation, this may account for the unusual dissemination of the disease in the sections where inoculation was resorted to."

Perhaps no more contemptible or dastardly means could be taken to deceive the public than the above—or to endeavor to injure a great public interest.

1st. No such number of hogs were ever inoculated.

2d. Last year the loss in inoculated hogs, done on farms by the owners themselves, was not half of one per cent. in many thousands.

3d. Not a hog has ever been inoculated on farms already infected (except in one case). The fact that there were no deaths among the inoculated hogs, and that not an owner sent for inocu-

lation (except a few very intelligent men of some years' experience) until the disease was all around him, speaks more emphatically for the truth and for inoculation than all such assertions.

But I need not say a word. The reader of the above quotation from the government will probably be afflicted with an acute attack of apoplexia when he turns to the Report of 1890, issued before the above letter was written, and sees the government recommending my system of inoculation, as the cheapest and best in spite of the terrible ravages of swine-plague it conjured up in its letter to the *Western Swine-herd*.

"This method of sub-cutaneous injections of culture liquids containing hog-cholera bacilli, while on the one hand *fraught with the possible danger (!)* of scattering diseased germs where they do not originally exist, *is nevertheless the simplest and cheapest method* that can be devised for the vaccination of animals; these qualities of simplicity and cheapness are of vital importance in a question which has only a commercial aspect." With such contradictory publications frequently bearing his name, and always emanating from his department, can the Secretary of Agriculture for a moment think the governments of Europe will have an iota of confidence in his so-called "Meat Inspection" or any of his assertions regarding the same?

I leave the question at this point for the consideration of others.

RECENT FOREIGN INVESTIGATIONS OF SWINE DISEASES.

BY LEONARD PEARSON, B. S., V. M. D.

Several German bacteriologists have recently investigated the various contagious diseases of swine, and the group of bacteria to which the causes of these diseases belong.

Frosch, in an article in the *Zeitschrift für Hygiene*, Vol. ix, 1891, makes the following statements: "According to Salmon, there are two distinct contagious diseases of swine in America, which he designates as "Swine-plague" and "Hog-cholera." This conclusion has been denied by Frank Billings, who doubts the etiological value of Salmon's bacteria, and claims that a germ discovered by him is the cause of the American swine diseases ;

which he describes together, as one disease, under the name "Swine-plague."

In 1888 Von Esararch studied, in the Institute of Hygiene, in Berlin, the Salmon hog-cholera bacillus and found that Salmon's statements were in the main, correct. Frosch has now studied the Billing's swine-plague bacillus, cultures of which were sent to the Institute of Hygiene, by the discoverer, and finds it to be identical with Salmon's hog-cholera bacillus. The microbe described by Salmon as the cause of *his* swine-plague, is regarded by Frosch, on the other hand, as of accidental occurrence in chronic hog-cholera.

The entire article is quite long, but the author has thus concisely stated his conclusions :

1st. Salmon's hog-cholera bacillus and Billing's swine-plague bacillus are one and the same.

2d. This germ is to be regarded as the cause of the contagious disease existing among the swine of America, while the proof of the existence of a second disease, of equal distribution, is not, as yet, established.

3d. This germ is, further, identical with the swine-pest bacillus of Selander's (Denmark), but differs from the bacillus of the German swine-plague from that of Wildseuche (a contagious disease of deer, wild hogs, and cattle, which occurs in South Germany), chicken-cholera, rabbit septicæmia, and the ferret plague.

4th. Of those last mentioned, the bacterium of the ferret plague is the only one which possesses peculiarities sufficiently pronounced to enable its recognition from others. (*Berl. Thierarz. Wochs.*, No. 27, 1891.)

Dr. Georg Caneva (*Centralblatt für Bacteriologie und Parasitenkunde*, Vol. ix, No. 17), studied the group of bacteria which have been classed together by Hueppe, as those causing hemorrhagic septicæmia. These are: hog-cholera (Salmon), swine-plague (Billings), swine-pest (Selander), "American cattle disease" (Billings), Buffalo pest Marseille's swine-pest (Jobert, Rietsch), and the ferret plague (Eberth). All of these bacteria agree in the following points: they liquify gelatine; do not form end spores; the poles may be stained with an aqueous solution of methylene blue but not by Graue's method; and there is a resemblance in form. Notwithstanding their apparent close relationship, the author found differences which enabled him to divide this group into three subdivisions.

The first includes the bacteria of Wildseuche, septicæmia of rabbits, swine-plague (of Germany) and Buffalo pest. These bacteria are characterized by lack of mobility, by the fact that they will not grow on potatoes, their growth on gelatine and on agar-agar is slow and sparse, they grow scantily on milk and kill rabbits in 1-3 days after the inoculation. The autopsy shows them to be present in the blood and distributed through the tissues.

The second division includes swine-plague (Billings), Marseilles swine pest (Epidémie des Porcs de Marseille), the "new American cattle disease" (Billings), and the ferret plague. These bacteria are distinguished by active mobility; they grow rapidly on potato and form a thick layer, but differ among themselves in the color of the film. They grow rapidly on gelatine and agar-agar and, on the latter, with the development of gas. Cultures in milk, at the incubator temperature (37°C.), develop an acid which coagulates the milk, but does not cause the solution of its suspended particles. White rats and mice are not susceptible to these bacteria and, upon being inoculated, only show a slight local reaction at the point of operation. The bacteria may be found in the blood and in the form of small emboli, in the capillaries, but never in the tissues themselves.

The third division consists of only the hog-cholera (Salmon), and swine pest (Selander) bacilli. These are not exactly alike, but show so many points of similarity that it is difficult to separate them. Both are actively mobile; they grow rapidly and profusely on gelatine. They also grow on agar-agar but without the formation of gas. They differ in their growth on potatoes, in that the swine-pest cultures resemble those of the typhus bacillus, while the hog-cholera bacilli forms a thick, whitish layer. Hog-cholera bacilli kills rabbits in from 4-8 days and cause a reaction at the point of inoculation. Subcutaneous injections of the swine-pest bacilli, on the other hand, do not kill rabbits but do white mice, in from 6-8 days.

Caneva's deductions from his experiments are : that Salmon's hog-cholera and Billing's swine-plague are two distinct diseases; that Billing's swine-plague and the Marseilles swine pest are, probably, identical; that, although Selander's (Denmark) swine pest and hog-cholera are closely related they are distinct diseases and, finally, that none of the above diseases coincide with the German swine-plague of Löffler and Schütz's. (*Zeitsch. für Vet. Kund.*, No. 4. Vol. iii, 1891.)

So far as the diseases of our swine are concerned it will be

noticed that the two investigators, above quoted, do not agree. It is, however, highly probable that they were not working with the same sort of material

The following extract, from an article by Dr. E. Bunzl-Fedem (*Archiv für Hygiene*, Vol. xii, Heft 2), throws some light on this point. This long article gives the results of the author's studies of the members of the septicæmia-hæmorrhagica group of bacilli, but since a review of it as a whole would occupy too much space we shall only mention the portion that deals with the diseases of swine. Cultures of the swine disease bacilli were made in sterilized milk, of neutral reaction, to which a small quantity of a litmus solution had been added, to show fermentation at its beginning, and on potato. Bacilli of swine-plague (Billings), and hog-cholera (Salmon), both grew in the sterilized milk, turning the litmus faintly red, in the first two days, but intensively blue in from eight to ten days. After seven months the milk had so evaporated that it formed a gelatine like mass, of alkaline reaction. Both of these bacilli formed brown films on potatoes. The German and Marseilles swine pests, on the contrary, developed an acid in the milk cultures.

From these and other experiments the deductions drawn are :

1st. That the swine-plague germ first cultivated by Billings does not agree with the description of that micro-organism.

2d. That Salmon's hog-cholera bacillus and the the last swine-plague bacillus cultivated by Billings are, biologically, identical.

Detailed experiments lead him to divide the contagious swine-diseases of the world into three classes, as follows : 1st. German swine pest and wildseuche ; 2d. Swine-plague, hog-cholera and Danish swine pest ; 3d. Marseilles swine pest.

These diseases differ in their specific causes ; which, in spite of their strong similarity, may be differentiated biologically in their symptoms and in their geographical origins.

Bunzl-Fedem believes that the future will develop methods for diagnosing the doubtful cases of swine diseases by means of the cultures and biological peculiarities of their bacteria. The gelatine cultures enables one to distinguish all three of the above diseases from erysipelas (*Rothlauf, rouget*) or anthrax. Milk cultures distinguish the American swine disease from the Marseilles and German, in that the first develops an alkali and the last two an acid. A microscopic examination suffices to separate the last two forms, for the bacilli of the French pest are actively mobile, while

those of the German have no motion. (*Berl. Thierärz. Wochs.*, No. 29, 1891.

From these, and other articles, it is quite clear that the most prevalent opinion in Germany, at the present time, is that there is but one swine pest in America; that is, that hog-cholera and swine-plague are the same.

Variations from this view probably rest upon experiments with those cultures of Billing's swine-plague bacillus first sent to Europe, by this investigator; which did not, Bunzl-Fedem says, agree with their description and were not the same as those sent at a later date.

SHOULDER LUMP.

BY WILLIAMSON BRYDEN, V. S.

In the April (1890) number of THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES, I reported a case of what was headed "Fibroid Tumor of the Shoulder."

A heavy buckskin horse used on a single-horse beer-wagon, commenced going lame in his off fore and hind feet, but was kept at work till a large hard "tumor" suddenly appeared a little above the point of the shoulder. On examination of the hind foot I found a very severe bruise that required poulticing and treatment for several days before he was fit to be used. The fore foot was in a bruised condition also, and caused the hoof to be placed unevenly on the ground, at the same time this condition of the extremity caused the animal to carry his shoulder forward in an awkward manner, so that the muscles above the "tumor" in front appeared somewhat wasted, plainly showing the predisposing cause and its history. I then examined the collar which was a fairly good fit and of good quality.

Having had a great many cases of the kind, the condition of the extremities, and especially the defective hoofs from their influence on the position of the shoulder and in causing disturbance to the muscular and connective tissues in front of it, had for a long time led me to suspect them of being an important factor in predisposing to this injury, it is therefore with a good deal of satisfaction that I am able to record a still further history of this interesting case, and as I fear greatly misunderstood disease.

I am led to say this after consulting both recent and older writers on the subject. Bouley is said (by a friend of his) to have remarked that "there is suppuration in ninety-five hundredths (95-100) of known cases." Such a remark needs no comment.

A recent book on "Lameness of Horses" in describing "Cold Abscess," recommends for its treatment such an array of painful operations as ought to satisfy the most enthusiastic of "Doctors." Blisters, explorations for pus, puncturings with red hot irons and other *weapons*, acids, caustics, seatons, excision and similar orthodox measures. Surely it is time that the profession left ruts that carry them to such temporizing expedients, such extremities of cruelty. Professor Williams, too, in the last edition of his "Surgery," page 414, although condemning severe external applications, still adhere to old "heroic" measures.

As soon as the hind foot was sufficiently recovered to be shod, he was set at work, the "tumor" having been kept bathed with warm water to remove a slight œdema caused by some degree of friction to the skin over it.

The collar was then opened, and a little of the padding withdrawn, an extra flat pad was made to fit just above the growth; in this condition he was put at work, but loaded lighter and easier. In a few days (four or five), the lump was found to yield on pressure. On being opened, it discharged about a gill of nice creamy *pus-like* matter. The wound then healed, and he was at work in less than two weeks, quite well.

He worked steadily then till last February, when I was again sent for by the owner, (Mr. Van Nostrand, of Crystal Lake Brewery,) to see the same horse. I found the fore foot twisted and requiring shoeing, a "tumor" nearly half the size of the first having made its appearance. I ordered him sent to the forge to get his foot trimmed and the shoe reset. His hoof was kept soft by stuffing every night, and the shoulder was bathed with an astringent wash every night and morning. He was then kept at easy work for a few days and the lump disappeared entirely, *having become absorbed*.

Again, about the beginning of April, on my return from the examinations at the Veterinary Department, McGill University, Montreal, I found him suffering the same as on its first occurrence, with the exception that he was not so lame behind. I repeated the former treatment and he was as well as ever in a few weeks, its course being the same as in the first.

The conclusions arrived at by me are that the changes in the

foot affect the muscles of the shoulder and limb adversely, the weight is thrown on it so that the front of the shoulder being too much advanced, is forced against the collar in such a way that the muscles and connective tissues become bruised and strained, a hard, circumscribed lump or swelling, sometimes of great size, then suddenly presents itself. If the animal is laid off work immediately on its appearance, it is not possible to find a *fully developed* centre containing the pus or pus-like matter, but when kept at work an abscess is rapidly formed, and at the end of a few days it will either have become absorbed, which occasionally happens when small, or be ready to open, or perhaps break. All that is then necessary is simple treatment and the wound will heal very rapidly.

My first impression was that such growths were somewhat similar to the soft corn between the toes in the human subject described by John Hunter long ago. The presence or absence of *matter* in such cases being dependent on the number of days the horse has been kept at work after the lump began to make its appearance. If laid up at once it remains nearly stationary for a long time. If kept at work, with the same or a similar collar—the exciting cause — it must mature within a few days.

It has been contended by some that working the animal with such a shoulder must be very painful and likely to cause balking. Of course it is possible to treat the case in a coarse, brutal way, but there is no necessity for this, and if *stimulating* and *irritating* applications that make the skin tender are kept from it, they will not refuse to pull a moderate load.

My conclusions have not been arrived at from a single case, but from a score within the last five years, every one I have had having recovered so far. I sincerely trust that those veterinarians who have such cases will give a fair trial to this method and report on it, for it has been rather a disappointment to me to find some so hard to convince, that they remain skeptical and continue their old treatment, which they say pays better.

PORRIGO ("TEXAS MANGE") IN HORSES.

BY GERALD E. GRIFFIN, D. V. S.Veterinarian, Fifth U. S. Cavalry.

Porriga, or—as it is commonly known south of Kansas and Missouri—"Texas mange;" though simple in its nature is one of the most annoying diseases or conditions of the skin met with in southern latitudes, it is prevalent among all classes of horses (and frequently cows), particularly those confined to the stable, as are the horses in the cavalry service. The disease is observed almost invariably during the warmer months and disappears on the advent of cold, although in two instances it has been seen to afflict the patients all through the winter.

The first intimation we receive of the appearance of the disease amongst cavalry horses is a report from the Farriers (troop Vet'y. nurses) or troop commanders, that a certain animal in his troop is afflicted with "the mange," an examination is made, when the animal is found to be in apparently good health and all functions normal, the hairs about the superior portion of the tail or about the middle of the mane may appear rough and tumbled, and if the animal is watched for a short time he will be observed to back up against the heel-post (if in his stall), and rub his tail against this object in a most vigorous manner, while at the same time he appears to derive considerable satisfaction from the operation; if the animal chances to be on the picket-line, or turned loose in the corral he will endeavor to get his neck immediately under the picket-line, or through the fence, and there rub his mane most determinedly for various lengths of time, grunting with satisfaction the while, pulling the hairs out by the root and after a time leaving the skin of the parts rubbed, in an abraded condition which though undoubtedly painful, does not deter the animal from continuing the rubbing operation at the next opportunity; after a period of about two weeks the inclination to rub or scratch is so pronounced that patients have been observed, when tied to a ring above their heads and out of reach of surrounding fixtures, to use their hind feet wherewith to scratch the mane, and so expert did one of these animals become in this mode of scratching that he rubbed nearly all the hairs loose from within four inches of his withers to his foretop, before he was detected. Although the constitution of the patient remains unimpaired and

his vigor undiminished, nevertheless, in a short time he presents a most deplorable appearance, the caudal appendage and neck being often denuded entirely of hair, he becomes an object of hatred to his rider and of ridicule to the remainder of the troopers, he still continues to rub and scratch the abraided and raw-looking parts until cold weather sets in when the itchiness seems to be relieved and the new hairs begin to make their appearance. In some cases the rubbing or scratching continues until the hair is rubbed off the back in patches up as far as the first lumbar vertebra and extending for a space of several inches on both sides of the median line, and anteriorly extending as far back as the tenth dorsal vertebra, giving the animal a most peculiar moth-eaten appearance.

On close examination of several cases that were held without treatment to observe the progress of the disease, it was found that it commenced with what appeared to be a small eruption—if it could be so called—of an apparently fluid nature, which in the course of 24 to 36 hours formed laminated scales, resembling fine white bran, this was accompanied by the itchiness and rubbing referred to above, and although the horse-brush was used several times a day these scales or exfoliations, continued to come off in undiminished numbers, while the skin and hair of the afflicted part presented a dirty, dusty appearance, as if it had been oiled and allowed to accumulate dust, and although the tail and mane were frequently washed, they again assumed this dusty appearance after a lapse of one or two days.

Is this disease contagious? it is thought not, as several experiments have been made, and long continued, all with negative results; when the first case was reported it was thought the rubbing was due to rectal irritation, and the animal was treated accordingly, but without success, when it was decided that the disease was "Texas mange," afflicted animals were tied in the same stalls, with those unaffected, to test its contagiousness, there was no other alternative, at all events, even if it was contagious, as the army, along with refusing to furnish a sufficient variety of drugs for veterinary purposes, have never, as far as known, made any attempt to furnish a veterinary hospital or an excuse for one although there is an order somewhere which says there *may* be a building set aside for this purpose, so that in suspicious cases or in cases of contagious diseases, the best animals in a troop are liable to destruction, by means of a bullet, for the reason that there is no safe place in which they may be held for observation.

Veterinary medicine will certainly never be much enlightened by the War Department from present appearances, but the results were negative, each troop at this post had from two to four animals with this disease, but in two years it has not extended beyond these particular animals, and it reappears regularly in these, year after year, when the hot weather sets in; exfoliations from affected animals were rubbed into the hair of the mane and tail of those who were free from the disease, but without producing any symptoms of the malady; as there was no microscope available, it was impossible to determine whether the symptoms were due to an organism or not, so the question still remains: Is this disease a dandruff, and if not, is it due to the presence of an organism, and if so, why does it not affect all parts of the body?

TREATMENT.

As the number of drugs allowed by the Quartermaster-General, who furnishes the veterinary supplies, is very limited indeed, it did not take long to exhaust, the search for suitable remedies from this source and of course without affecting a cure. Drugs were purchased from private funds—it would be a waste of time to ask the Quartermaster's Department to furnish anything out of the old rut (as far as veterinary supplies are concerned) which is at least fifty years' behind the times—and after numerous experiments the following treatment was found to be effectual. *Phytolacca* extract, applied locally, after thoroughly washing the affected parts, the treatment to be continued every second day. The mercurial ointments and sub-caustics were tried with but poor results, but the treatment which gave the best satisfaction, while at the same time being cheap was as follows: equal parts of cosmoline and coal tar, heated to 200°F., to which was added powdered cantharidies, in the proportion of one to ten; this compound was applied every third day, when the rubbing ceased, the skin regained its tone, and in the course of three or four weeks a cure was in all cases effected.

It was stated by a Texas cattleman, who was well acquainted with "Texas mange," that he always effected a cure in his own animals by a liberal use of wagon grease, thinned down with coal oil, which was applied frequently with friction; this rather homely treatment was tried and with good results, but it was found that its virtue lay in the rancid wagon grease, which acted as a light blister, stimulating the skin and the growth of the hair. Another, and more elegant preparation, but rather expensive, which was

found to be very effectual, was glycerine and tannin, eighty grains of the latter to one ounce of the former, applied with a sponge daily for one week, followed by embrocations of carbolized oil, if the surface is at all abraded.

As it is not definitely known to what to attribute the cause of this disease, the writer will be pleased to furnish scrapings from mane and tails of affected animals to any microscopist who may be interested enough in the above to make an investigation.

EXTRA-UTERINE GESTATION—A CRITICISM.

By J. BLAND SUTTON, London. *

In the April issue of this Journal, Professor Hamilton described a case of "extra-uterine pregnancy in the cat," and, after some remarks on the subject of extra-uterine gestation in general, he concludes his paper with the following expression of opinion: "The only explanation admissible under these circumstances is that the fecundated ova fell either from the ovary directly or from the end of the tube into the abdominal cavity, and took root upon the parts of the peritoneum with which it came in contact."

This sentence indicates that the present distinguished Professor of Pathology, at the Aberdeen University, believes, like many distinguished and, in certain directions, extremely credulous obstetricians, in the possibility of what is known as *abdominal pregnancy*. Fearing lest this opinion, emanating from high authority, may do mischief in helping to perpetuate this erroneous belief, I venture to criticise the matter in the light of our knowledge of extra-uterine gestation in the lower mammals, and of the evidence adduced by Professor Hamilton in describing the facts of his case.

A prolonged and wide search through veterinary literature, and an examination of the few museum specimens supposed to illustrate extra-uterine gestation, have served to convince me *that there is no specimen or description of a case of tubal pregnancy in a mammal, other than the human female, that will bear criticism.*

It may be at once pointed out that the mistake is due to the circumstance, especially when the facts are reported by medical

* From *The Journal of Comparative Pathology and Therapeutics*, June, 1891.

men, that the reporters invariable mistake the elongated uterine cornua for Fallopian tubes. This is not surprising when we remember that in so many mammals the tubes are rarely thicker than whip cord, and are usually coiled up and partially concealed in the walls of the ovarian sac. With a little care, however, and taking the expanded abdominal ostium as an indicator, no difficulty should be experienced in detecting the tube.

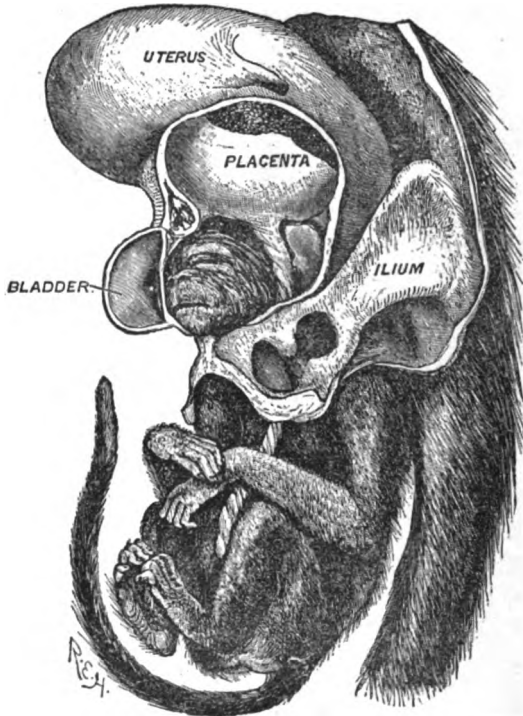


FIG. 1:

Incompleted delivery in a monkey, due to abnormal size of the fœtus.
(Museum, Royal College of Surgeons.)

The conditions usually reported as extra-uterine pregnancies are due to the following causes :—

- I. Abnormal retention of the fœtus in the uterus.
- II. Rupture of the uterus, or of one of its cornua, and retention of the embryos in the peritoneum or sub-peritoneal tissue.

In domesticated mammals the gestation period for a given species varies within certain limits. Hence eleven months for a

mare, nine months for a cow, five months for ewes and goats, four months for sows, two months for the bitch and cat are, like nine months for woman, only average periods.

Pregnancy may in cows or mares over-run the average by a few days, two weeks, a month, or even more, and a healthy foetus be born. With such conditions we are not concerned. The expression, *abnormal retention of a foetus* is applied to those cases in which an animal goes to full term and then passes through an



FIG. 2.

A mummified calf retained in the uterus eighteen months. (Museum of St. Bartholomew's Hospital.)

ineffectual labour; the pains pass away, the abdominal enlargement subsides, and as a rule the rut fails to appear, the animal remaining permanently sterile.

(1) *The causes of abnormal retention of the foetus in the uterus are—*

1. Unusual size of the foetus.
2. Torsion of the uterus or one of the cornua.

It is well known that when the male is large and out of proportion to the female, the foetus may be too large to pass through

the pelvis. An example of this is sketched in Fig. 1. The drawing represents the pelvis and uterus of a Macaque monkey (*Macacus sinicus*) which died during delivery. When the keeper left the monkey-house in the evening he noticed the animal was restless; on his return next morning it was dead, with the limbs and trunk of a full-time foetus protruding. The pelvis was far too small to allow the head to pass out. I presented the specimen to the museum of the Royal College of Surgeons (4274a.)

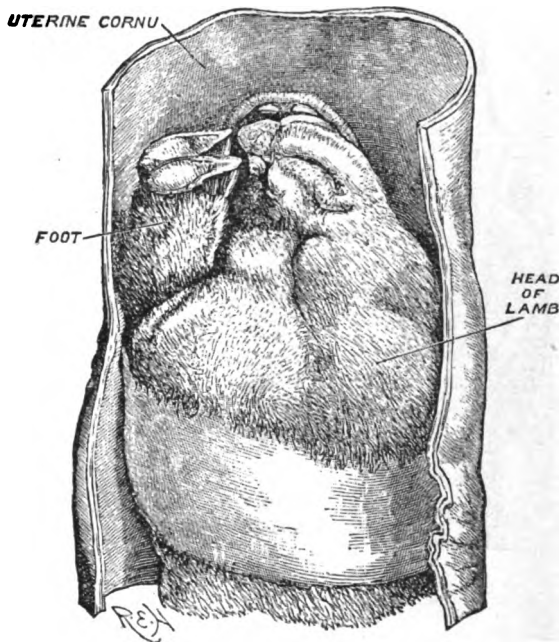


FIG. 2.

The head and one of the feet of a lamb retained in the uterus.
(Museum of the Royal College of Surgeons.)

The foetus may be retained from unexplained causes. One of the most remarkable instances of this is the specimen presented to the museum of St. Bartholomew's Hospital, by Dr. Matthews Duncan. The history of the case is briefly this:—

The Earl of Southesk's famous cow "Esmeralda" was served, July 7, 1865; she had rinderpest in December of the same year, when probably the foetus died and the cow recovered. There were no signs of labour during the rinderpest or at the date when pregnancy should normally terminate. She was regarded as having become sterile and was fattened for the butcher. On

October, 1867, the almost forgotten pregnancy was brought to recollection by the discharge of a mummified calf without anything like the usual manifestation of labour. In this case it is of course possible that the death of the foetus was the cause of its retention.

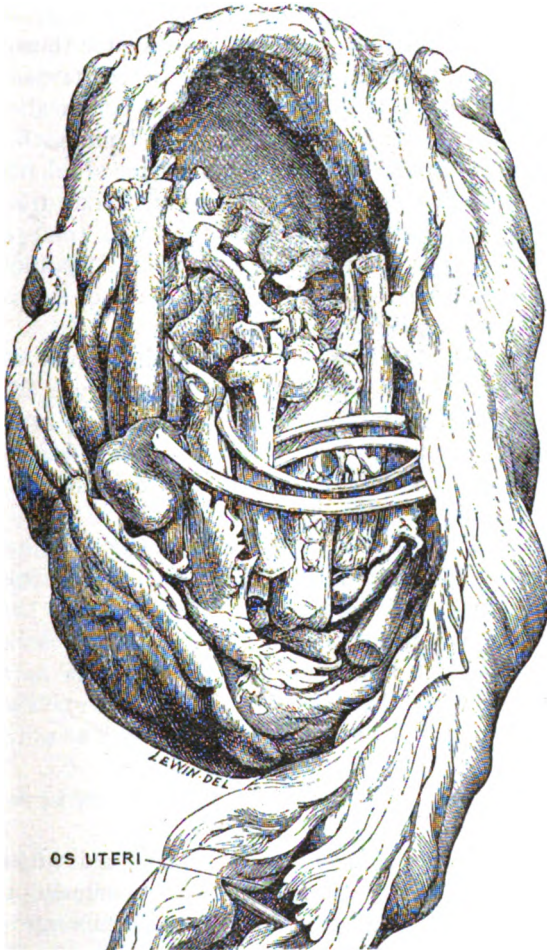


FIG. 4.

Intra-uterine maceration of a retained lamb.

This case presents an unusual feature, for the rule is that when a foetus is retained in the uterus from causes other than torsion it rapidly undergoes putrefaction ; in some cases it becomes converted into the peculiar substance known as adipocere.

The museum of the Royal College of Surgeons contains some specimens illustrating this condition taken from cows and ewes. One of them is "a portion of the horn of the uterus of a sheep containing the head and of the feet of a lamb, which remained in the uterus beyond the ordinary period of gestation and became adherent to the surrounding uterine wall." Several of these specimens are *Hunterian*. When a foetus is retained and air gains access to it, or, in consequence of adhesion to the intestines, intestinal gases enter the gestation-sac, decomposition rapidly ensues, and the soft parts rapidly decay and make their escape, accompanied by putrid and highly offensive discharges, either through the vagina, or rectum, or by fistulous tracts in the abdominal wall. Occasionally the bones will come away, but more frequently they are retained, and when the animal dies, or is killed, the uterus is found filled with a more or less completely macerated skeleton (Fig. 4).

Axial rotation, twisting or torsion of the gravid uterus is an interesting accident. It has been most carefully studied in the cow. The whole uterus may rotate, the twists involving the vagina and cervix uteri. The rotation may vary from half a turn to three or more complete revolutions. The directions of the twist may be to the right or to the left.

Complete torsion offers an effectual barrier to delivery unless help is afforded by art, and this is rarely of much service. The effect upon the cow is often to cause death by hemorrhage, exhaustion, or rupture of the uterus. In rare cases the cow survives the accident, remains sterile, and the true nature of the case is revealed when the animal is handed over to the butcher. Under such conditions the foetus is found either as a lithopædion or as a mummy.

When the torsion involves one cornu, it may be so complete as to actually lead to its detachment.

Mr. Hutchinson* reported a specimen of this which he met with in a hare. The abdomen contained a rounded tumour as large as a big orange; the tumour fell out when the belly was opened. On careful dissection it was found to be a detached cornu of the uterus containing two foetal hares. The specimen was submitted to a committee consisting of Dr. Ramsbottom and Mr. Simmonds. These gentlemen furnished a very careful report, and at the end appended the following remarks:

* Trans. Path. Society, Vol. V., p. 352, 1854.

“Three circumstances are especially worthy of remark in this case—*first*, there were no signs of putrefaction ; but this is the well-known result of the exclusion of atmospheric air ; *secondly*, that both foetuses were lying in one Fallopian tube ; consequently both ovules had been furnished by the same ovary, whereas usually each cornu uteri is impregnated, if, as is commonly the case, there is more than one foetus ; and, *lastly*, that the cyst containing them was quite loose, and not attached to any part of the mother's body. Nevertheless, there must of necessity have existed a connection, and the probability is that the nipple-like projection was the point of communication, and that a forcible separation had taken place, most likely after the animal's death, in consequence of its body having been subjected to rough usage.”

It might be argued from this opinion that this was a case of tubal gestation, but Hutchinson in describing the specimen writes :

“As in the hare, the uterus itself is but a small pouch in the vaginal extremity of the Fallopian tube, and as gestation is normally carried on partly in the latter, it is idle to dispute the question whether the foetation was extra-uterine or not. It was evidently *normal*.”

It is clear that what Mr. Hutchinson and the reporters called a Fallopian tube was really the long uterine cornu natural to hares and rabbits, and was not a case of tubal gestation in the proper sense.

Detachment of the uterine cornu has been reported in the ewe by Simmons,* and Fleming quotes four cases described by Ercolani.† The specimens, of which the following are brief descriptions, are preserved in the museum of the Bologna University :

1. The uterus of a cow, which contained in one of the cornua a foetus beyond its term, and in the other horn such a quantity of mucus that it would be difficult to decide which was the larger cornu. The uterus is completely divided at the cervix, and floats in the abdominal cavity, being attached only by the broad ligaments, which are thin and distended. The detached portion of the uterus has a globular form, and its perfectly smooth surface is everywhere covered with peritoneum. Where the separation

* Veterinary Record, Vol. V., p. 492, 1842.

† Veterinary Obstetrics, p. 184.

has taken place the organ is closed by the cicatricial union of the border of the rupture. The foetus was contained in the right cornu, and appeared to have lived beyond the ordinary period of gestation, to judge by the hoofs, as well as the teeth which were cut. The foetus was curled up and formed a large discoid body.

2. Cornu of the uterus of a pregnant cow, containing a completely developed foetus markedly indurated. This cornu, perhaps ruptured during parturition, was detached and hung almost free in the abdomen; while the rupture has cicatrised, and there is formed a large cyst, everywhere closed, and containing the foetus. The walls of the uterus are for the most part fibrous, and the foetal envelopes coriaceous. Like the preceding case, it was found in a cow which had been slaughtered by the butcher; the cornu fell on the ground after some fibrous bands which attached it to the sub-lumbar region had been cut through.

3. The uterus of a sheep arrived at the termination of pregnancy. The organ had been torn in the vicinity of the vagina, and remained free in the abdominal cavity. In this instance, also, the uterus forms a completely closed cyst, which contains a very much indurated lamb. In detaching this organ an irregular cicatrix was seen, which led to the supposition that the accident was due to torsion of the cervix.

4. Posterior part of the body of a guinea-pig, which shows the right horn of the uterus detached and cicatrised at the point of separation. This horn, which was half free, was filled with fluid blood: the distension caused by the blood has been so great that the horn ruptured in the middle, and the foetus must have died from hemorrhage.

The following case of rotation of the uterus which occurred in a cat, quoted by Fleming,* is of interest, as it describes the changes produced on the uterus by this accident. They are similar to those seen in rotated ovarian cysts:

“Vivier† had a fine large cat, two years old and just dead, brought to him. A few hours previously it had been apparently quite well. The owner, thinking it had been poisoned, wished a *post-mortem* examination to be made. On incising the abdominal parietes, he was surprised to find one of the uterine cornua suddenly escape from the opening. This cornu was deeply con-

* Veterinary Obstetrics.

† Archives Vétérinaires, Sept. 1876, p. 424.

gested ; indeed, it was almost of a violent tint, and the veins were gorged with dark-coloured blood. The other cornu was less voluminous, but offered the same lesions. It was evident the cat was pregnant.

“When the abdomen was completely opened, it was discovered that *the uterus had made two turns upon itself* ; the cervix presented the spiral appearance characteristic of torsion ; the broad ligaments were intact, and had followed the uterus in its revolution. The two cornua being opened length-ways, they were found to contain a large quantity of black blood mixed with clots ; in this fluid were five foetuses (three in one cornu and two in the other) contained in their membranes, and probably about fifteen days old.”

(2.) *Rupture of the uterus and retention of the embryos in the peritoneum or sub-peritoneal tissue.*

The gravid uterus may be ruptured from traumatic causes ; with this we are not concerned. A not infrequent cause is that the foetus is too large to traverse the maternal passages, the uterus in its violent contractions to overcome the obstruction ruptures, and the foetus or foetuses may be discharged into the peritoneal cavity. In such cases, the foetus may be found in the abdominal cavity, while the placenta remains in the uterus ; in others, the placenta as well as the foetus will be extruded into the peritoneal cavity. After the foetus escapes, the uterus rapidly contracts, hence a slit which allows a full sized foetus to escape from the uterine cavity rapidly becomes reduced to an opening of very small dimensions. It is unusual for a case of this sort to give rise to any difficulty in interpreting the course of events, and the majority of such accidents terminate fatally. In rare instances the mother survives.

A drawing of the uterus of a jackal in which the rent occurred on the dorsal wall of the vagina, involving also the cervix of the uterus, is shown in Fig. 5.

Returning to Professor Hamilton's account of the anatomy of the parts in the cat, I am of opinion that the most probable explanation is that, during pregnancy, rupture of the uterus occurred, allowing the kittens to be extruded into the peritoneal cavity ; as it is an air-tight chamber, and the kittens formed no intimate connections with intestine, they became converted into the curious conglomerate masses found by Professor Hamilton. The precise condition of the vagina and adjacent parts of the uterus could not be ascertained because “the uterine horns had

unfortunately been cut off close to their peritoneal extremities.' Another significant sentence is this: "The body of the uterus is firmly clasped by the tumour mass, and its channel appears to have become impervious, apparently from the pressure of the surrounding parts." It is not beyond the bounds of probability that this "impervious" part presents the situation of the original rent in the uterus through which the embryos were ejected.

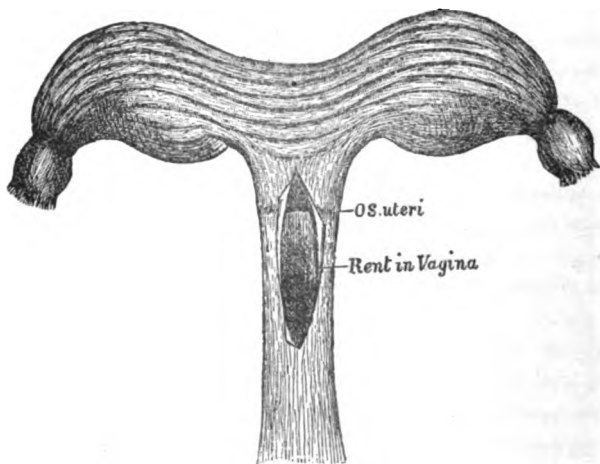


FIG. 5.

The uterus of a jackal, which ruptured at the junction of vagina and cervix. The fetuses were free in the peritoneal cavity.

Professor Hamilton writes: "Tait and others have alleged that these extra-uterine pregnancies with a peritoneal attachment of the placenta have originally been tubal, that the tube has burst, that the escaped placenta has wandered outwards, and that, slug-like, the placenta has fastened itself to some part of the peritoneum." And he pertinently adds, "I cannot bring myself to believe in such an occurrence." My own inquiries are exactly in accord with this decided expression of unbelief, and I go even further, for when Professor Hamilton writes: "It seems one of the most extraordinary phenomena in nature that the wall of a serous cavity should thus assume functions entirely foreign to it," I would add, *there is no reasonable evidence to lead us to believe that such an event occurs either in women or in other female mammals.*

In concluding this paper let me add that there is no accurate or reliable description of a case of *tubal-gestation* in any animal save the human female on record. That this form of gestation occurs, I have no doubt, but it awaits demonstration.

TETANUS.*

BY DR. CLAUDE D. MORRIS.

Tetanus is a constitutional traumatic infective disease which acts upon the central nervous system primarily, and which is clinically characterized by spasm and rigidity of definite muscular groups, as a physiological result of the ptomaines of bacillus tetani.

Bacteriological studies and the classification of this disease as of an infectious character is of recent date. In 1859 Betali related the case of a bull that died of tetanus after castration, several slaves ate of the flesh of the dead animal, and of these three were seized in a few days with tetanus, and two of them died. In 1870 Angar reported a case in which a horse had spontaneous tetanus, after which three puppies which had been in the same stable were also affected. Larger, in 1853, saw a woman who had a fall while cleaning a farm-yard, causing a slight wound of the elbow, four weeks later she was seized with tetanus, and on investigation it was found that a horse affected with that disease had been in a stable opening into the yard, where she fell. He also mentioned another circumstance, in a small village, where tetanus was previously unknown, five cases appeared in eighteen months under quite different climatic conditions. Of these, one had been taken to a hospital, after which two others in the same ward became affected with the disease.

The oxogenous origin of the disease has been proven by Nicolaier, who produced the disease by injecting into the tissue of the animals bacilli taken from earth.

Rosenbach found the same bacillus in the pus of a patient suffering from traumatic tetanus.

The identity of the bacillus of tetanus, with Nicolaier's bacillus of earth tetanus, was demonstrated by Koch in 1887.

The physical characters of bacillus tetanus, stained with fuchsin 1-1000, are those of an anærobic micro-organism, which presents more than ordinary life, with a spore at the extremity having the appearance of a broken drum-stick. Kitasato, in speaking of the bacillus, as to its function of reproduction, says, that the bacillus tetani produces spores in thirty hours, in culture kept at a temperature of the body, they possess great resistance to heat, as

* Read before the New York State Veterinary Medical Society.

they have been found active after an exposure of an hour to 80°C. of moist heat, but they are destroyed by placing them in a sterilizer heated to 100°C. for five minutes.

The bacillus has been found in different kinds of surface soil and in street dust. By man it has been found in tetanic patients in the wound-secretions, in the nerves leading from the seat of infections and in the spinal cord.

CULTIVATIONS, INOCULATIONS, EXPERIMENTS, ETC.

It has been a question of dispute among pathologists as to the specific cause of the disease. The same questions have been raised in connection with the pathogenic action of the bacillus tetanus, as with pus-microbes, *i. e.* Is the disease of which it was the specific cause due to the presence of the microbes, or the ptomaines which it elaborates in the tissues? It has therefore been demonstrated beyond a doubt that the ptomaines of the bacillus of tetanus cause tetanic convulsions.

However, symptoms in many respects analagous to that of tetanus, can be produced with strychnina, when given in toxic doses. If this and other drugs belonging to the same group can act upon the spinal cord in such a manner as to cause spasms and muscular rigidity, we should therefore expect that if the microbes of tetanus produced ptomaines in the tissues, these might produce the same effect on the cords, and that the symptoms are produced by them and not by the direct actions of the microbes.

It is conceded by nearly all authorities that there are but few bacilli present in the blood of tetanic patients, and in many instances in which the disease was produced artificially, the blood was often found sterile. On the other hand, more microbes have been found at the seat of primary infections and in the tissues, between it and the spinal cord, than in the blood itself.

Perhaps stronger proof than any as yet brought forward, to show that the direct cause of the disease is the product of the microbes, and not the microbes themselves, is the experiments made by Brieger, who has succeeded in isolating four toxic substances from mixed cultures of the tetanus bacillus in sterilized emulsion of meat.

First, Tetanus, when administered subcutaneously in mice produced the characteristic symptoms of tetanus.

Second, Tetanotoxin causes first, tremors, followed by convulsions and paralysis.

Third, The muriate of toxin produces well-marked symptoms

of tetanus, besides exciting the lachrymal and salivary glands to increased functional activity, the last spasmotoxin, also produces clonic and toxic spasms which prostrate the animal at once.

As to the etiology of tetanus, it has been clearly demonstrated beyond all doubt, that the disease is due to microbe influences, whether ushered in as a traumatic or idiopathic disease, or artificially produced by infections of wound secretions of tetanic patients, or by using mixed or pure cultures. The essential cause of the disease is the bacillus first discovered by Nicolaier in earth, and by Rasenbach in the wound secretions of a tetanic patient. The period of incubation seems to be extremely variable in both man and animals. In some cases existing only twenty-four hours, in others lasting weeks, between the time of infection and the first manifestations of the disease.

This may be accounted for, first, the number of bacilli introduced into the system may be so small that a longer time is necessary before the disease is manifest. Second, the character and location of a surgical operation in many instances acts as an infectious atrium. Also the anatomical characteristics of the tissues surrounding it may influence the time which is necessary to develop the disease, and further, the investigation of Brieger's, have shown that the tetanic convulsions are produced by infections of tetanus and of the toxic ptomaines, derived from cultures of the bacillus of tetanus. It is more than probable that the active symptoms of tetanus are due, not to the presence in the tissues of the bacillus, but to the toxic action of the ptomaines on the spinal-cord, so that the duration of the period of incubation is further modified by the capacity of the infected tissues to yield to different ptomaines, as in the second instance, the character of certain surgical operations play an important part as an infectious atrium in the practice of veterinary surgery.

My experience leads me to believe that operations and injuries in the soles of the feet, and as a sequel to castration and the extripation of the thyroid gland for bronchocele, are operations in which the greatest tendency to this disease resides.

Wiess, reported thirteen cases of tetanus occurring after removal of the thyroid gland. In fifty-three total extractions of the thyroid glands for goitre, made by Billroth, tetanus followed in twelve cases, while no cases occurred in 109 partial operations.

Gautier has collected seventy-four cases of tetanus, thirty-six following abortion, and thirty-eight following confinement; autopsies were made in fifteen cases, three presented on microscop-

pical examinations of the brain and cord, no appreciable lesion. In one case a retained putrified placenta was found in the uterus, in five suppurative metritis, in one ovarian cyst, in one hemorrhage into the lateral ventricles. Ten patients recovered, five after abortion, five after labor.

As to symptoms, diagnosis, and other details of the same, I consider it unnecessary to delineate before such a body as this, as all present are conversant with the symptoms of tetanus. There is only one thing, however, I would enjoin, that is, a too hasty diagnosis may result in a little embarrassment, as the writer has been twice deceived upon the first and hasty diagnosis.

In one case it was in a five year old mare, used for road purposes; she had gone lame three or four days previously. The owner sent the stable boy to the drug store, to procure a pound of ground flaxseed, he having other shopping to do returned to the store and took what he supposed to be his package. On arriving at the stable he made the necessary preparations to putting the lame foot into a poultice. In so doing he offered the animal a handful of his flaxseed, which he says she seemed to eat with delight. The poultice was applied at eleven o'clock. I was called to see the animal, she at that time was standing in a box, tied in opposite directions, right fore-foot pointing in a neatly prepared poultice, head and tail extended, saliva and froth issuing from the lips which were closed, ears erect and stiff. Body rigid and in convulsions and in a slight perspiration.

Upon raising the head and slightly tapping the neck I noticed that the membrana nictitans did not move over the orbit, as is so constant in tetanus, yet in the absence of that symptom I felt justified in my diagnosis. The only history I could get of the case is that already stated. I ordered poultice removed and parts washed, as I wished to examine the foot. At this point in the proceedings I was able to find the cause of these tetanic convulsions.

The poultice was made of powdered *nux vomica*, instead of ground flaxseed, and the quantity the animal had eaten was about $\frac{3}{4}$ ii.

In citing this case it is for the purpose of showing the physiological effect of this drug on the nervous centres and upon certain muscular groups.

As in tetanus we get like symptoms produced by the physiological effect of the bacillus, what they are capable of throwing off, and certain other peculiar substances "resembling alkaloids"

which are produced during the process of putrefaction of the dead ones in the system.

Regarding the treatment of this disease, nearly every known element that acts as a nervous sedative has been used to a greater or less extent with varying degrees of results; experience, however, leads me to believe that drugs play a minor part in the successful issue of the disease, and that no one drug can be relied upon as a panacea. That the disease must be treated according to the various stages of the disease, at the time we first see it, is to my mind, a very essential feature. If seen in the early stages when there is but partial rigidity of the voluntary muscles, and trismus is not perceptible, and deglutition is but little if any impaired; a thorough purge at this stage is the sheet-anchor of success, followed with Soda Hyposulphite and Carbolic acid, enjoining at the same time perfect quietude. If the patient is not seen until all the symptoms are well established, the jaws more or less firmly set and occasionally convulsions, to offer a purge at that stage must be guarded discriminately. However, if it can be administered without exciting the animal, it is beneficial. I have had the best success under these circumstances by administering subcutaneously Sulphate of Eserine and dilute Hydrocyanic Acid, by allowing the animal to drink alternately the Bromide of Potash and Hyposulphite of Soda.

If the disease is the result of an injury, thoroughly cleanse the wound and treat it antiseptically.

AGE OF THE HORSE, OX, DOG, AND OTHER DOMESTICATED ANIMALS.

BY R. S. HUIDEKOPER, M.D., VET.

[Continued from page 382.]

AGE OF THE OX.

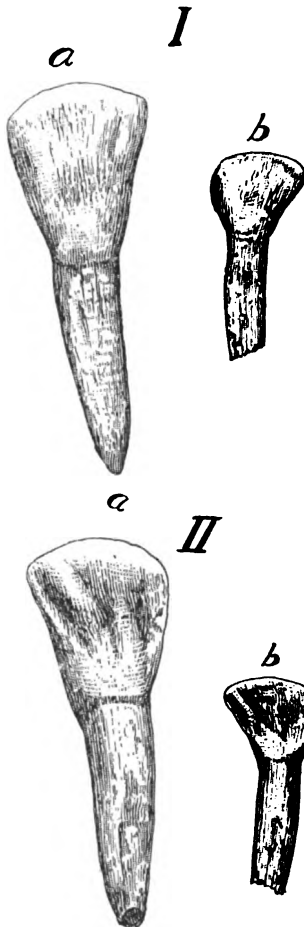
The age of the ox has demanded much less study than that of the horse, on account of its shorter life, and the more limited time in which it is utilized for specific purposes. In a growing animal the evidences of its youth are unmistakable. Arrived at adult life, the difference of a year or two in its age is less important, in regard to its value, than it is in the horse, and later

becomes even less so. The age of the ox is determined by the changes which take place in its dentition, and the wearing away of its teeth, and by the changes in the growth, form, and appearance of its horns.

DENTITION OF THE OX.

The ox has thirty-two teeth, twenty-four molars, arranged as in the horse, in arches of six, on either side of each jaw, and eight

FIG. 81.



Left Pincher Teeth of the Ox.

I. External faces.

II. Internal faces.

aa. Permanent Incisors.

bb. Temporary Incisors.

Natural size.

incisors in the lower jaw, with none in the upper. In rare cases there are rudimentary molars (wolf teeth), but when these exist in the young mouth, they drop before the permanent dentition is complete. Tush teeth are not present.

INCISORS.

The upper jaw is devoid of teeth, but the intermaxillary bones are covered by a dense cartilaginous cushion and strong gum, which furnishes a resisting body to the incisors of the lower jaw, in the prehension of food.

In the lower jaw there are eight incisors, arranged like the ribs of a fan, on the spatula shaped arch formed by the extremity of the maxillary bone.

The incisors instead of being fixed solidly in their alveolar cavities, like those of the horse, are imbedded in them, on a layer of cartilage, which allows of a considerable amount of motion, and thereby, probably protects the cushion of the upper jaw from injury in seizing food, which is crushed rather than cut off.

The two middle incisors are known as *pinchers*, the next ones on either side as *first intermediate* teeth, the next as *second intermediate*, and the outside ones as *corner* teeth.

The two pinchers are slightly sepa-

rated, on account of the cartilaginous symphysis of the maxillary bones in the ox ; this is much more marked in the first dentition. The other teeth touch each other by their extremities, and form a complete arch, but, from their shovel shape, are not in contact along their borders, as the wedge shaped incisors of the horse are.

The incisors are composed of a crown and a root, separated by a distinct neck giving them a somewhat shovel shape. The crown or free portion is flattened from above to below and becomes (Fig. 81.) thinner and broader at its anterior extremity.

The external or under face is convex in both directions, it is of a milky white color, and is striped with little longitudinal ridges and gutters, which become polished smooth with age. The internal or upper face is almost flat, but has a conical elevation, the base of which is directed towards the free border with which it merges, while its sides are bordered by small gutters. The internal border is convex and the external border is concave which gives the tooth a curved shape, and which indicates the side to which it belongs. The root is rounded, conical and yellow in color ; its extremity, in a young tooth, shows the opening of the dental canal.

STRUCTURE.

The incisors have approximately the same structure as the tush tooth of a horse, they are composed of a dentine, with the free portion covered by a continuous layer of enamel. The enamel is thickest on the external surface and gradually disappears on the root. In the young tooth there is a large, simple, dental cavity filled with the dental pulp, but as the animal gets older, a dark yellow dentine is deposited, until the cavity is filled up, and the tooth ceases to grow. It is not pushed from its alveolar cavity, as the incisors of the horse are as the free portion is worn away.

Like the horse, the ox has two sets of incisors, the temporary, or milk teeth and the permanent ones. The milk teeth are distinguished from the permanent ones from their being smaller and narrower, their enamel is thinner and more transparent and they are more curved to the side. Their roots are very short, and are pushed out by the replacing permanent incisors.

The incisor scarcely reaches its full development when it commences to be worn by its contact, and constant friction, with food and with the cushion of the upper jaw. The wearing commences at the anterior border and removes the enamel

towards the posterior part of the upper face; when it has completely removed the conical eminence and the lateral gutters, the tooth is said to be *leveled*, and the table is formed. From the almost horizontal direction of the incisor teeth, the wearing of their tables takes place in an oblique direction to their long axis.

The table at first is large, consisting of a plate of dentine, surrounded by a border of enamel and having in its centre a transverse line of dark yellow, made by the uncovered, later, deposit of dentine in the pulp cavity. As the tooth becomes smaller towards its root, the table becomes smaller and narrower, and the dental star becomes narrower, but it also becomes longer from in front to behind, until it forms a distinct square, as it is exposed by its posterior face from the oblique leveling.

As the incisors are worn away, they seem to separate from each other at the roots, as the narrower parts of the crowns are held apart by their cartilaginous beds, which do not atrophy, as does the maxilla of the horse, when the narrow wedge shaped roots are almost driven from their alveolar cavities.

When the teeth are worn down to their roots, the gum retracts, and shows the yellow stubs which are all that is left of the incisive arch. (Fig. 88 *b*.)

With the wearing away of the incisors, the dental arch loses its regular curve and becomes depressed in the middle.

MOLARS.

The ox has, like the horse, six molars in each arch, on either side of each jaw. The arch is shorter, as the teeth are smaller. The first molar is very small and each increases in size to the sixth, but there is such a marked difference in the size, that the first three teeth occupy but the third of the arch, while the last three complete the posterior two-thirds.

In the ox, the molars have the same compound arrangement of enamel, as in the horse, filled up by dentine, and surrounded by a layer of cement; the latter often exists in great quantity, and is of a rich yellowish color. There seems to be a greater difference in the relative density of the substances, and the ridges of enamel stand out in sharper points.

As in the horse, there are three temporary molars, and six permanent molars.

According to Girard, the first temporary molar appears from

the sixth to the twelfth day, following the eruption of the second and third molars, which are sometimes through the gums at birth, or appear immediately after birth..

The permanent molars make their appearance in the following order: 2d molar from twelve to eighteen months; 1st molar from twenty-four to thirty months; 3d molar at thirty-six months; 4th molar at eighteen months; 5th molar at twenty-four to thirty months; and the 6th molar at three years or later. When the rudimentary molar (wolf tooth) exists, it appears about the tenth month, and is driven out of its alveolar cavity with the appearance of the 1st permanent (4th) molar at the age of two years.

Simonds claims, that the molars do not show in the calf at birth, and first make their appearance at the end of the first month. Simonds also differs slightly from Girard as to the eruption of the permanent molars, placing the appearance of the 4th molar at six months; the 5th at fifteen months; the 6th at two years. He evidently studied on very precocious cattle. Undoubtedly the eruption of the molars in cattle is variable, and owing to the trouble of examination in the living animal, its careful study has been neglected.

An annexed table shows the diversity of eruption in various subjects, it will be found to vary somewhat not only in the different races of cattle, but in the families of the same race, which are reared under different climatic conditions, and are nourished more or less liberally.

The periods of the animal's life, as indicated by the teeth, form the following natural divisions:

- 1st, Eruption of the temporary teeth;
- 2nd, Wearing of the temporary teeth;
- 3rd, Eruption of the permanent teeth;
- 4th, Leveling of the permanent teeth;
- 5th, Wearing away of the crowns.

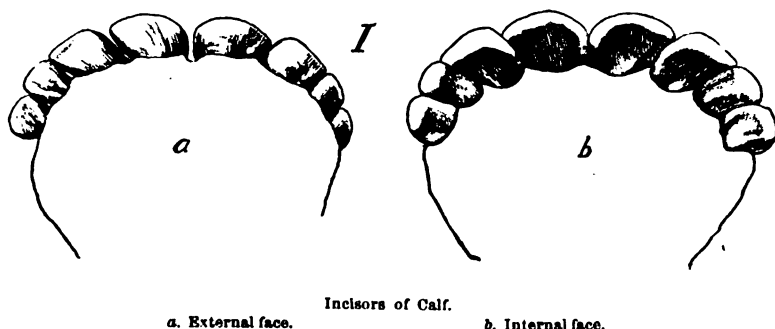
DETERMINATION OF AGE BY THE TEETH.

With the young calf to be slaughtered for veal the absolute age is usually less important than its condition of development and its weight, but may be the cause of serious legal question and require the most acute preception on the part of the expert to decide and testify in controversies between the suspected butcher and the rigid law.

FIRST PERIOD.

Eruption of the Temporary Teeth.—The calf is sometimes born with no incisors, but usually the pinchers and 1st intermediate teeth have pierced through the gums. The 2d intermediate teeth appear about the tenth day, and the corner teeth seven to ten days later, but may appear as late as the thirtieth day. The incisors do not reach the same level and complete the arch until the fifth or sixth month. (Fig. 82).

FIG. 82.



SECOND PERIOD.

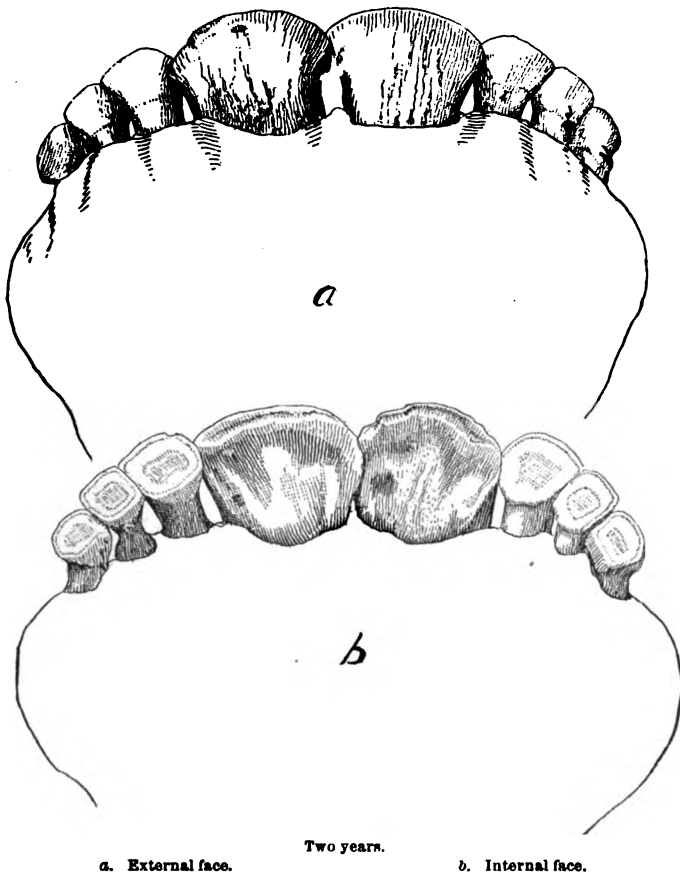
Wearing of the Temporary Teeth.—The leveling of the milk teeth is very variable, according to the food on which the calf is fed. In calves fattened for the butcher with milk, the wearing is slow, while in those that are put early to pasture, and are fed on dried forage, the leveling takes place much more rapidly; the pinchers are worn at their anterior borders at six months, and are leveled at ten months; the arch is broken in the centre, and loses its continuity at the 1st intermediate, at one year; 2d intermediate, at fifteen months; and, at the corner teeth at eighteen to twenty months.

THIRD PERIOD.

Eruption of the Permanent Incisors.

TWENTY MONTHS.—At this time the milk pinchers are replaced by the permanent ones, which protrude somewhat obliquely, but soon assume their natural position and are in place at two years. (Fig. 83.)

FIG. 83.



a. External face.

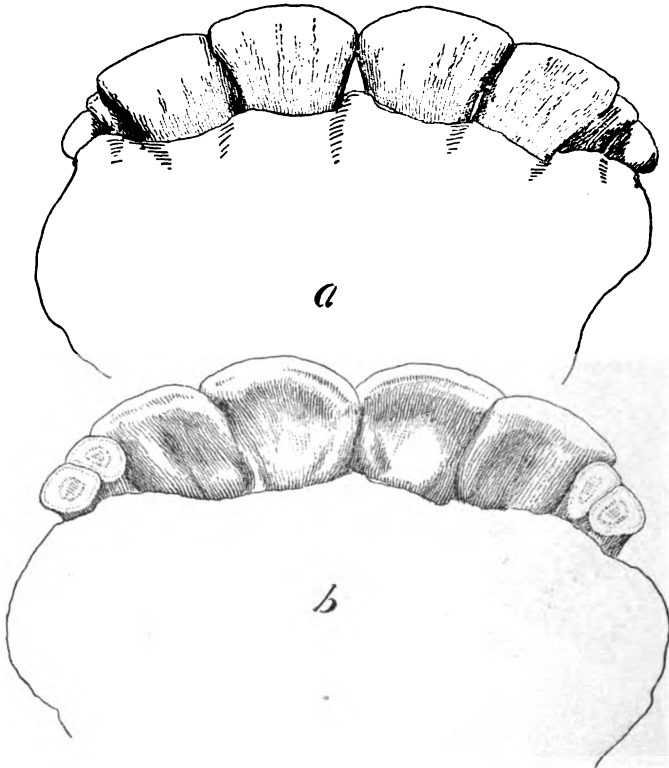
Two years.

b. Internal face.

The crowns of the permanent pinchers, in this month, have not quite become free from the gums, the left hand tooth is somewhat in advance of the other, and its enamel just shows traces of use.

TWO YEARS, SIX MONTHS.—Between two and one-quarter years to two years and nine months the 1st permanent intermediate teeth have accomplished their eruption. (Fig. 84.)

FIG. 84.



Two years, nine months.

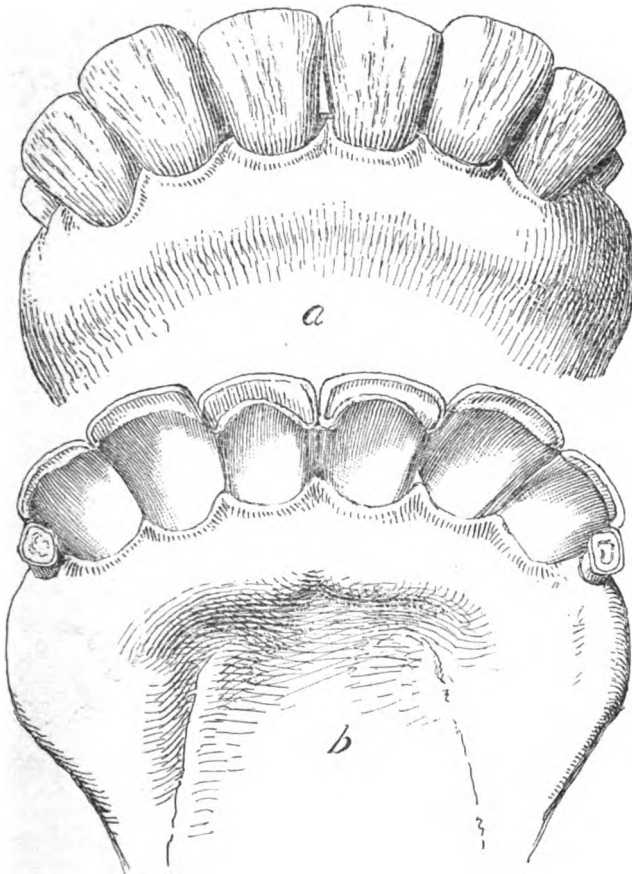
a. External face.

b. Internal face.

In this mouth the crowns of the 1st intermediate teeth are free from the gums, and the root of the 2nd intermediate (temporary) is pressed on and its position slightly displaced.

THREE YEARS, THREE MONTHS.—Between three years and three and one-half years the 2nd intermediate have replaced the milk teeth. (Fig. 85.)

FIG. 85.



Three years six months.

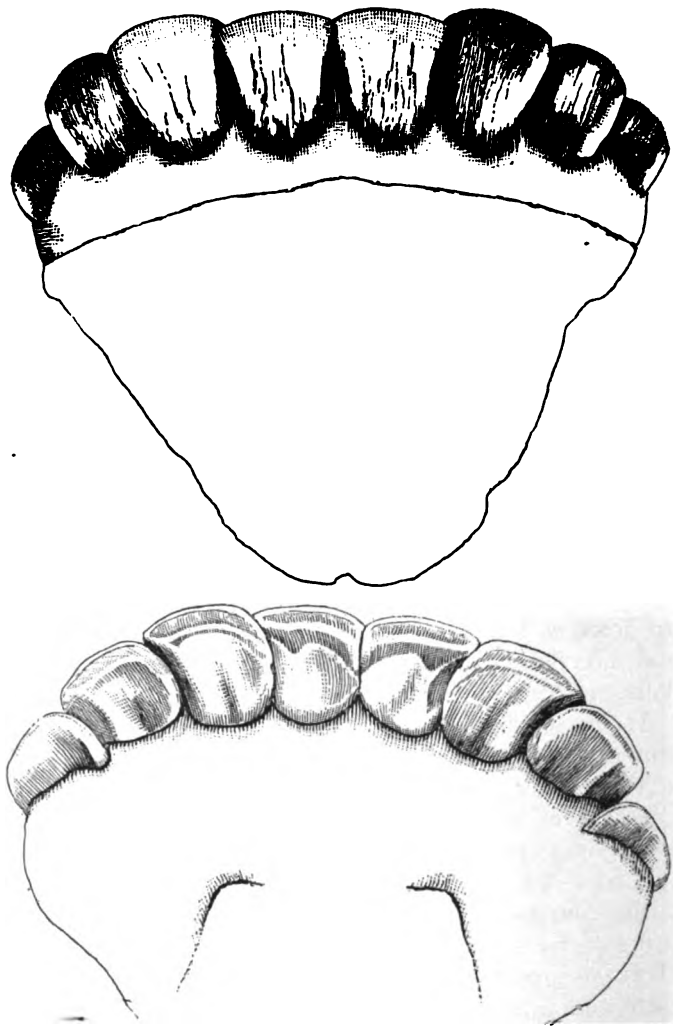
a. External face.

b. Internal face.

In this month the second intermediate teeth have reached the level of the incisive arch and their enamel has commenced to be used.

FOUR YEARS.—Between three years and nine months and four years and six months the corner teeth are completely through the gums and the mouth is complete. (Fig. 86.)

FIG. 86.



a. External face.

Four years.

b. Internal face.

The permanent corner teeth have just replaced temporary ones, and are still in an oblique position, not having completely emerged from the gum.

FOURTH PERIOD.

Leveling of the Permanent Teeth.—At five years the pinchers have commenced to level.

At six years the pinchers are leveled, both pairs of intermediate teeth are nearly so, and the corner teeth are somewhat worn. (Fig. 87 *a.*)

At seven years the 1st intermediate teeth are leveled, the 2d intermediate are much worn, and the corner teeth have lost their enamel at the anterior extremities.

At eight years the entire tables are leveled, and the pinchers commence to show a concavity, which corresponds to a convexity of the cushion of the upper jaw. (Fig. 87 *b.*)

At nine and ten years this concavity extends to the intermediate teeth, the table of the pinchers is almost square, and the dental star of the pinchers and 1st intermediate teeth has become long and distinct. (Fig. 87 *c.*)

During this period, from six to ten years, the rounded arch formed by the incisors gradually loses its convexity until it almost forms a straight line. The teeth appear to separate and the gum shows between them.

FIFTH PERIOD.

Wearing away of the Crowns.—From this time on there is a progressive change in the shape of the teeth, the crowns become worn down with more or less rapidity they diminish in size, the dental stars become larger and square, the teeth seem to separate, and the retracting gum leaves the yellow roots uncovered.

At ten years the dental star is square in the pinchers and the 1st intermediate and the corner teeth are leveled.

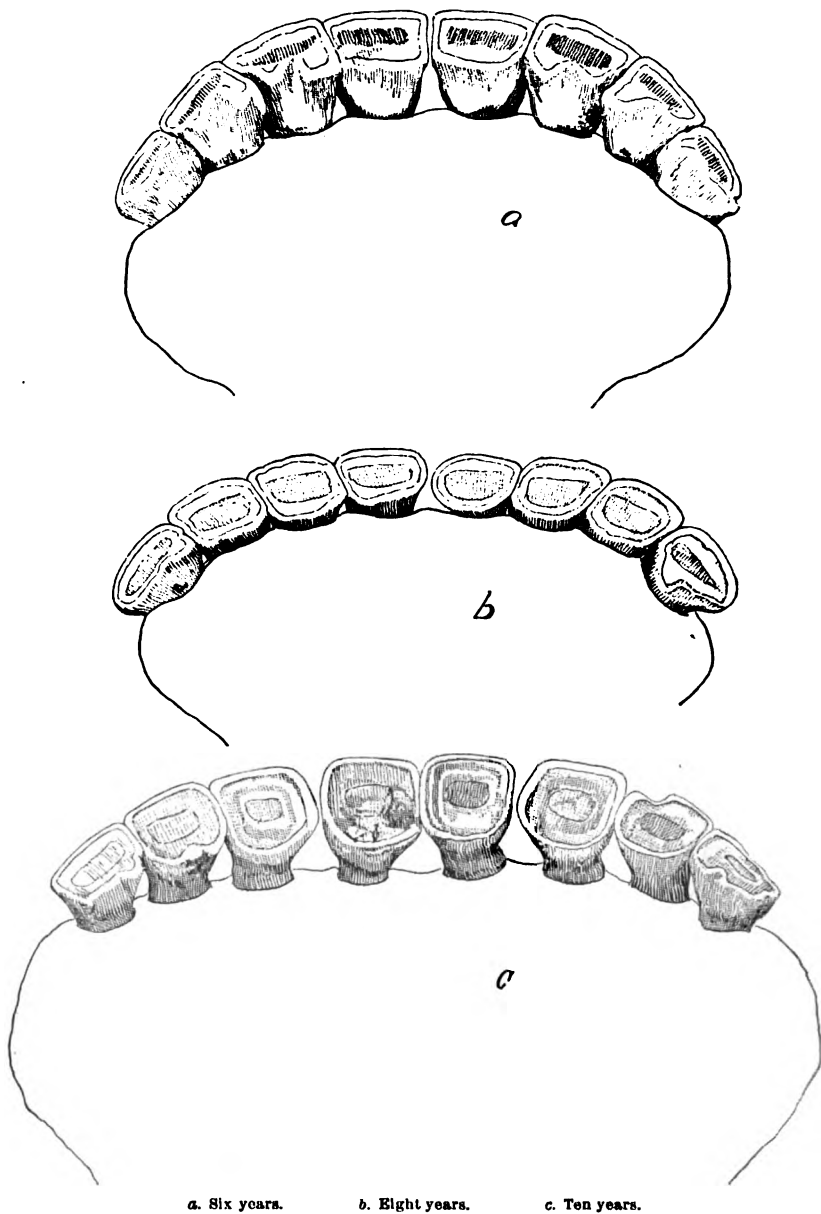
At eleven to twelve years the dental star is square in all of the teeth, which become triangular in shape and commence from this time on to be worn to stubs. (Fig. 88 *a.*)

It must always be borne in mind, that the race of the animal and the character of the food, produce great variations in the wearing of the teeth. Animals fed on hard forage, and those fed on brewers grains will have their teeth worn down much more rapidly than those fed on the prepared food of the ordinary dairy.

DETERMINATION OF AGE BY THE HORNS.

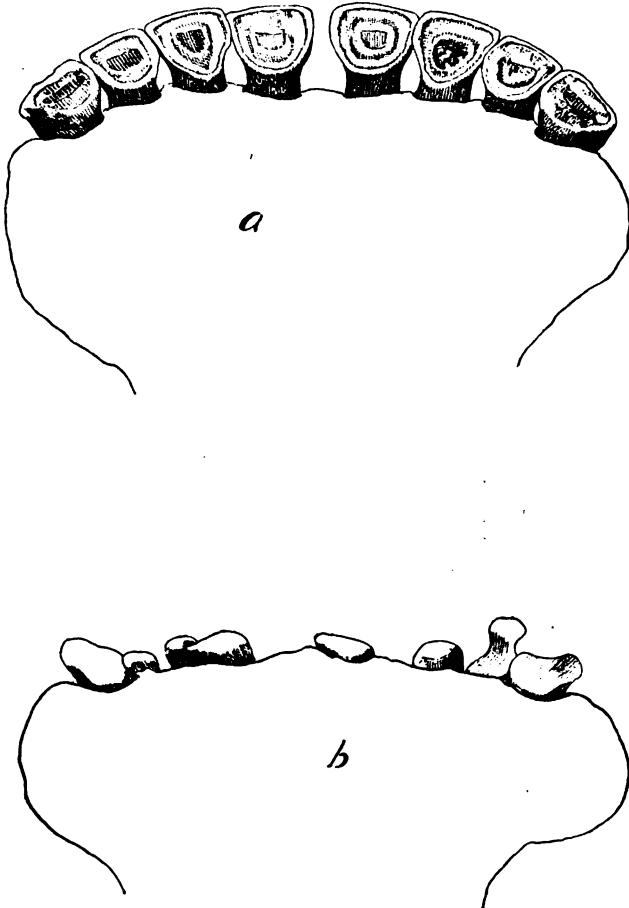
The horns of cattle, rising more or less gracefully from the frontal bones, were undoubtedly intended for weapons of offense

FIG. 87.



and defense. All breeds of cattle are provided with horns, except that known as the angus or polled angus, which was indigenous to the northern part of Great Britain from the earliest historical times, but of which we have no trace in prehistoric deposits.

FIG. 88.



a. Eleven years.

b. Fifteen years.

Among all varieties of cattle individuals may be devoid of horns ; they are known as "mulley," or if deprived of their horns artificially (dehorned-dishorned) are called "polled." Polling has been done by the Hindoos for over the last two thousand years, without ever showing trace of producing hereditary results.

The horns are symmetrical in shape, and when there is any noticeable difference in the length, size or curve of the horns, it may be assigned to some previous injury, disease or accidental cause.

According to the character, habits and surroundings of the various races and individuals, we find the horns more or less modified in size, shape and strength.

In the semi-wild races, like those of Asia, Hungary, Spain, Texas and South America, the horns may attain enormous size, five feet in length; while in the most civilized, domesticated races, like the Durham, Dutch and Channel Island cattle, the horns tend to diminish in size, and may be but a few inches long.

The bull has strong, stout, short, straight horns, dense in structure, which seem to be as much points of hold for his massive, heavy head, as actual weapons in times of warfare; the female has longer, sharper, more delicate horns, designed to use in emergencies. The steer has horns, which are a compromise between those of the two sexes, longer than those of the bull and larger than those of the cow.

The horns have for a basement two *cores*, or conical bony projections of porous structure, richly supplied with blood vessels, and containing air cells which communicate with the sinuses of the frontal, occipital and maxillary bones.

The cores are covered by a dense fibrous vascular membrane, from the outer face of which, corresponding to the chorion of the skin, the horns grow. The horns themselves are conical tubes more or less curved, consisting of concentric layers of epithelial growth.

Soon after birth the calf shows two little, hard, rounded points at either side of the frontal bone, which slowly emerge from the skin. At eight or ten days the point is through the skin and shows the color which the horn will have later; at three weeks a distinct little flexible horn has appeared. At five or six months the horn has commenced to curve on its long axis and assume the direction it will have later. Up to this time and during the first year the horn is covered by an epidermic prolongation of the skin, similar to the covering of the hoof of the foal at birth, but by the twelfth to fifteenth month this covering has dried and scaled off, leaving the natural, shining, tough surface of the horn proper.

In the second year the horns start a fresh growth, and a

small groove is found encircling it, between the substance secreted the first year and that which developed in the second.

During the third year a similar activity in growth takes place and a second groove is found marking the line between the two years' growth. These two grooves or circular furrows around the horn are not well marked and have been frequently overlooked and all trace of them disappear as the animal becomes older.

From three years on, the growth of the horn is marked by a groove or furrow, much deeper, and so distinct that they show between them a decided elevation or "ring" of horny substance, which forms an accurate basis for estimating the age of the animal.

In an animal over three years of age we count all of the horn beyond the first groove as indicating three years, and add one year to its age for each groove and "ring" which is present toward the base of the horn.

The grooves are always better marked in the concavity of the horn than on the convex surface. In feeble, ill-nourished animals they are but slightly marked.

Many causes, however, tend to diminish the value of the "rings" and grooves in the estimation of age. In "show" cattle and in herds of cattle kept for show, the horns are frequently sandpapered, scraped and polished to give them the fine appearance of delicate texture, which with that of the other integument, indicates the similar condition of the mammary gland for secreting milk and of the connective tissue for forming fat. Dealers scrape the horns to destroy the evidences of age in the animals which they have for sale. In old cows there is an atrophy of growth and an apparent contraction of the base of the horn, the rings, and grooves are much less distinctly marked and may be indistinguishable.

In the first four years the teeth are the most valuable indications of age; from four to ten years the horns furnish the more accurate signs, and after ten years a careful comparison of both is required to determine approximately the number of years which have passed.

TABLE OF ERUPTION OF THE TEETH IN THE OX.

	SIMONDS.		GIRARD.	OTHER AUTHORITIES.		AVERAGE.	
	Race and other causes favoring development	Race and other causes retarding development		Minimum.	Maximum.	In precocious animals.	In common animals.
Temporary Incisors.							
Pinchers.			At Birth.	Before Birth.	3 days.	At Birth.	At Birth.
1st Inter- mediate.			At Birth.	Before Birth.	5 days.	"	"
2nd Inter- mediate.			5th to 9th day.	Before Birth.	12 days.	5 days.	12 days.
Corners.			13th to 19th day.	Before Birth.	35 days.	12 days.	18 days.
<i>Molars.</i> 1st.	After Birth.	1 mo.	6th to 12th day.	At Birth.	1 mo.	6 to 12 days	18 to 30 days.
2nd.	At Birth.	Earlier.	Earlier.	"	Few days.	At Birth.	After Birth.
3rd.	At Birth.	Earlier.	Earlier.	"	"	"	After Birth.
Permanent Incisors.							
Pinchers.	1 yr. 9 mo.	2 yrs. 3 mo.	19 to 21 mo.	15 mos.	2 yrs. 3 mo.	1 yr. 6 mo.	20 mo.
1st Inter- mediate.	2 yrs. 3 mo.	2 yrs. 9 mo.	2½ to 3 yrs.	2 yrs. 3 mo.	3 yrs.	2 yrs. 3 mo.	2 yrs. 9 mo.
2nd Inter- mediate.	2 yrs. 9 mo.	3 yrs. 3 mo.	3½ to 4 yrs.	2 yrs. 9 mo.	4 yrs.	3 yrs.	3 yrs. 6 mo.
Corners.	3 yrs. 3 mo.	4 yrs. 9 mo.	4½ to 5 yrs.	2 yrs. 10 mo.	5 yrs.	3 yrs. 9 mo.	4 yrs. 6 mo.
<i>Molars.</i> 1st.	2 yrs. 6 mo.		2½ to 3 yrs.	2 yrs. 3 mo.	3 yrs.	2 yrs. 6 mo.	
2nd.	2 yrs. 6 mo.		12th to 18th mo.	1 yr. 6 mo.	2 yrs. 6 mo.	1 yr. 6 mo.	
3rd.	3 yrs.		3 to 4 yrs.	3 yrs.	4 yrs.	3 yrs.	
4th.	6 mo.		18 mos.	6 mo.	1 yr. 6 mo.	1 yr. 6 mo.	
5th.	1 yr. 3 mo.		2½ to 3 yrs.	1 yr. 3 mo.	3 yrs.	2 yrs.	
6th.	2 yrs.		3 to 4 yrs.	2 yrs.	4 yrs.	2 yrs. 6 mo.	

EDITORIAL DEPARTMENT.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The semi-annual meeting of the Pennsylvania State Veterinary Medical Association, will be held at the County Medical Association rooms, Coal Exchange Building, Cor., River and Market Sts., Wilkesbarre, Pa., Tuesday, Sept. 8, 1891, at 10 o'clock P. M.

The general order of business will be conducted, and reports of the following committees :

Committee on Legislation, Dr. W. A. Hoskins, chairman; Committee on Intelligence and Education, Dr. R. S. Huidekoper, chairman; Committee on Sanitary science and Police, Prof. W. L. Zuill, chairman.

Essays by Dr. W. H. Hoskins, "The Veterinarian as a Sanitarian"; Dr. S. E. Weber, "Pleurisy and its Complications"; Dr. J. F. Butterfield, "Results of Laryngitis."

ROBERT GLADFELTER,
Cor. Secretary.

THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The 28th annual meeting of the United States Veterinary Medical Association, will be held at Willard's Hall, Willard's Hotel, Washington, D. C., on Sept. 15th to 17th 1891.

Arrangements have been made with all railroads in the Trunk Line Association, Southern Traffic Association, and Central Traffic Association, who will grant the usual one-third rates to all members and delegates in attendance. All persons attending this meeting will procure certificates from the railroad ticket agent at point of starting, paying full fare going, and present their certificates for the signature of the Secretary of the Association at the meeting, which will entitle them to a one-third rate returning. Tickets will be issued three days in advance of the meeting and will be good for three days after the meeting.

All members in or near Chicago are advised to join the party

leaving Chicago on Sunday September 13, 1891, at 2:55 P. M., via the Baltimore and Ohio, and are advised to confer with Dr. W. L. Williams, Bloomington, Ill., at once in regard to arrangements.

The Program, beginning on Sept. 15th, will be as follows :

8:30 A. M., Meeting of the Comitia Minora; 10 A. M., Annual meeting convened; Roll Call; Address of welcome to the members by the President; Unfinished Business; Reception and consideration of reports of the Comitia Minora.

At 12:30 noon adjournment for lunch, provided by the courtesy of the Veterinarians of Washington and Baltimore.

Afternoon Session :—Reports of Committees.

First, Committee on Intelligence and Education; second, Finance Committee; third, Committee on Diseases; fourth, Prize Committee; fifth, Special College Committee; sixth, Committee on Army Legislation; seventh, Publication Committee; eighth, Special Committee on a Central Organized Body; ninth, Special Committee on food Inspection; tenth, Secretary's Report; eleventh, Reports from Assistant (State Foreign) Secretaries; Discussion of reports of Committees; Election of Officers; New Business.

Sept. 16th 1891, Morning Session :—

10 A. M. Roll Call; Papers by Dr. C. C. Lyford, Minneapolis, Minn., on "Barren Mares"; by Dr. W. Bryden, Boston, Mass., on "Foreign Cattle Transportation, and its Regulations"; by Dr. W. L. Williams, Bloomington, Ill., on "Rachitis"; by Dr. R. S. Huidekoper, New York, on "Identification." Postponed discussion on Prof. Liautard's paper on "Veterinary Jurisprudence." Several other papers of interest will be offered.

Discussion of Papers and Reports of Cases. At 7 P. M., a banquet will be held at Willard's Hotel.

The headquarters of the Association will be at Willard's Hotel, where a special rate of \$3.00 per day has been made for members.

It is specially important that, immediately upon arrival, the members will report at the Reception room and register, giving full particulars as to city address, etc.

This meeting promises to have the largest attendance of any since the organization, in 1863, and every member should attend, and do his share towards its success.

Committee of Arrangements.—Dr. R. S. Huidekoper, Chairman, New York; Dr. W. Horace Hoskins, Philadelphia; Dr. Wm. Dougherty, Baltimore,

Local Committee of Arrangements:—Dr. E. S. Walmer, 3222 M. St., Dr. F. L. Kilborne, Dr. A. A. Swedburg, Washington, D. C., Drs. Wm. Dougherty, G. C. Faville, A. W. Clement, and W. H. Martinet of Baltimore.

NEGLECTED OPPORTUNITIES—AGRICULTURAL SHOWS.

Although the original *raison d'être* of Agricultural Shows is often lost sight of in the money-making schemes of local tradesmen and jockey-horse-owners, which corrupt the intentions of the founders, yet it is always acknowledged that the object of a show of animals is, by comparison of their relative merits, to determine which is the better animal, and by awarding such animal a badge of distinction, to attract attention to it, and thereby reward the intelligence of the owner, and advertise the animal for the benefit of the community. The award of prizes to an animal should indicate to the community that the animal receiving it is of an excellent and advantageous type, and should be a guarantee to the public, that such animal has no detectable defects, and that it is a safe, good animal to breed from, and that it is the standard towards which they should bring their own animals.

Unfortunately this is not always so. Competent judges are not always selected, even if competent on special subjects, the judges are often ignorant and narrow-minded, outside of the one class of animal they are interested in themselves. Judges are sometimes dishonest.

Does the veterinarian throughout the country take his proper position in regard to agricultural shows? We can safely assert, that he does not, and that he should. He, of all others, is one, who should be one of all Boards of Judges, to decide that a stallion or mare is deserving of a prize, that such animal has not a defective hock, an anchylozed ring-bone or a respiratory trouble, which, however handsome the animal may otherwise be, it will transmit to its progeny, and injure rather than benefit the community. He is the one to detect evidences of tuberculosis and other troubles which should render a bull or a cow unfit to receive a prize. He is the one to instruct the public that a thoroughbred, no matter how

fashionable his pedigree, should not be awarded a blue ribbon if it has defects which are hereditary.

Now is the season of agricultural shows; how many veterinarians are judges at them? a very few; and to whom belongs the blame? It is too late now to remedy the matter this year; but, now is the time to remedy it for next year. Let every veterinarian visit his county fair, and examine the animals critically, note the errors of judging; which are due to want of proper anatomical and physiological knowledge, which could have been supplied by a veterinarian. Then write the county newspaper, a just review of the merits of the animals, and of the prizes awarded, leaving out all personalities and prejudice, and let time show the community, in the products of these animals that the expert was right.

THE JOURNAL will be glad to have these reviews and criticisms of the various agricultural fairs, to use for a general review of the results obtained from such fairs. The manner of conducting horse-racing at fairs is an important subject, as it may be of great benefit to the horse industry if properly managed, and may produce serious harm if improperly governed.

A horse show, a cattle show, a show of any industry should be an educator to the people, and the merits of the living articles should be explained by the veterinarian to those who are less instructed. If he goes no further than to make a careful study of the breeds and individual qualities of the animals, the veterinarian will be rewarded by the education he obtains himself.

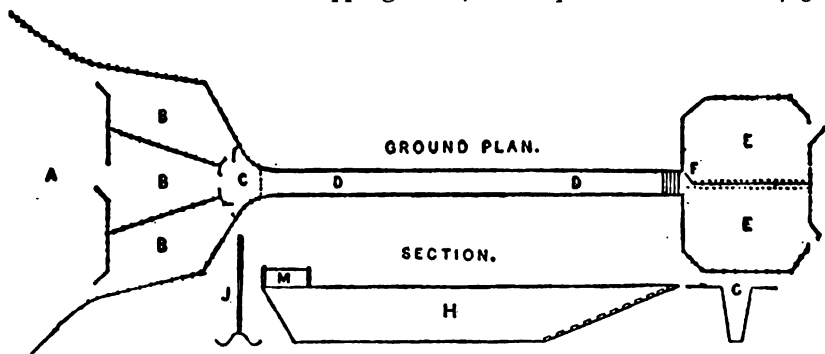
A DIPPING VAT FOR SHEEP.*

We are indebted to Messrs. Cooper, the well-known sheep-dip manufacturers, for the following description of a swimming bath greatly used in Australia for dipping large flocks of sheep:—

HOW TO BUILD A DIPPING VAT.

These suggestions, the result of practical experience in all parts of the world, are only intended to convey some idea of the general method of arranging a suitable dipping station. The details can of course be varied to suit individual requirements.

* From the *Agricultural Journal*, Cape Colony, Africa.



A. Mustering inclosure into which the sheep to be dipped are collected.

BBB. Pens by means of which the sheep are conveyed a few at a time from the mustering inclosure to the small internal pen c, in which a man is placed to pass them singly into the bath.

DD. The bath or swim, usually fifty feet long, five feet deep, twenty-one inches wide at the top, tapering to six inches wide at bottom, as shown in section G. For a short distance along the sides at the entrance end of the bath a board M, two feet high, should be fixed to catch the splash. Towards the end at which the sheep leave the bath the bottom should rise gradually, with ribbed foothold, to the level of the draining pens as shown in section H. This will greatly assist the sheep in getting out, besides economizing wash.

To avoid having to constantly measure the water when replenishing the wash, it is well to have a guage board fixed in the bath and marked plainly at frequent intervals to indicate from time to time the number of gallons which are added.

EE. The drawing pens. These are filled alternately by means of a swing gate F which serves for both pens. Each pen should be large enough to hold not less than 200 or 250 sheep.

A great saving of wash will be effected if the floors of these pens be made slightly sloping from the outside towards the dividing fence, into a gutter, to conduct the drippings back to the bath.

J. Crutch for pressing the backs of the sheep under the wash as they swim along the bath. It can also be used to assist any that are too weak to swim.

Never build a shorter bath than is above suggested whatever Dip may be used.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN.

BY LEONARD PEARSON, B. S., V. M. D.

TREATMENT OF BOG SPAVINS.

Prof. Hoffmann, Stuttgart.

(Repert. der Thierheilk. 52, 4.)

The most important point in the treatment of all blemishes of this class is rest; if necessary a sling. The hock should be made immobile by a bandage of plastic felt, plaster of Paris or strips of leather and a rubber bandage. In fresh cases pressure is of the greatest service and can be most conveniently applied by laying a bunch of jute or oakum, as large as the fist, on each side of the dilatation and covering them with a rubber bandage, run from below upward and tightly drawn. Such a bandage should not remain longer than 2—3 hours and after its removal the skin must be rubbed with a liniment composed of equal parts of alcohol, ammonia and turpentine. After 8 hours the bandage may be again applied, for two hours, and the liniment again used after its removal. The bandaging and rubbing may thus be alternated until a general swelling surrounds the joints, after which the bog-spavin often disappears. During this treatment it is advised to give the horse only dry food and water but once in three days. Blisters have also given good results, in fresh cases, but the water treatment and massage can not be recommended.

When the gall is hard and painful the above treatment may relieve the pain but does not remove the enlargement. Neither blisters, "absorbing ointments," the firing iron nor setons give the wished-for result. The treatment must directly affect the synovial membrane of the joint. The best method of applying this treatment is to place the horse in stocks, shave and disinfect a small part of the surface of the gall, lightly burn a spot the size of a pea (for the sake of more perfect disinfection), introduce a hypodermic needle and draw off the contents of the point with an aspirator. 10 gms. of a solution of iodoform in ether 1—10. is at once injected, through the same needle; the needle withdrawn and the small hole closed with a hot iron. The horse is

now placed in slings, pads of jute soaked in carbolic acid and water applied to the joint and the rubber bandage put on, followed by the liniment, as described above. When this operation is antiseptically performed it is absolutely without danger. In 2—3 days the bog spavin always reappears, in its former dimensions, and the operation must be repeated for 4 to 6 weeks, at the end of which small galls will have disappeared and the large ones, if not cured, will be much reduced in size. If the wound becomes infected with septic organisms and suppurates the joint capsule must be freely opened, at its most dependent points and drained. The result of such an accident is invariably a stiff joint and the horse will be fit for nothing but slow work. This complication may be prevented by rigid antiseptic precautions.

In contrast to the great danger of opening a joint, by incision, the tendinous sheaths may, with the assistance of antiseptics, be opened in this way with comparatively little risk. *Berl. Thierarz. Wochenschrift, No. 30, 1891.*

A CASE OF TUBERCULOSIS IN A HORSE.

Army Veterinarian Lebbin.

The reporter was called to see a horse with the following history: The animal had been losing flesh for six weeks; had a dull cough, especially when in the open air; showed difficulty of respiration and had had a few light attacks of colic. The bowels were very irregular; diarrhoea and constipation alternated. For the last 3 weeks the horse had refused his oats and ate nothing but a little clover hay.

The examination showed the patient to be a horse, 12 years old; hair dull and rough; flanks hollow; temperature 31.9°C .; pulse 58, weak and irregular; respiration 30 and oppressed and the conjunctiva pale. Percussion revealed several small dull spots in the lungs and auscultation bronchial, crepitant and friction sounds. Pressure upon the upper end of the trachea caused a weak, painful cough. Peristalsis was active.

In spite of the treatment and care the animal died the 13th day after the first visit. The autopsy was made six hours after death and showed the following: the lungs weighed one-half more than normal, and the lower portions felt firm. The cut surface was studded with small nodules, the size of a millet seed or pin head, of a yellowish-white color and the centre was

calcified. The bronchial lymph glands were enlarged to the size of a man's fist, were of a firm consistency, the cross section was grey and sprinkled with small yellowish nodules. The bronchial mucus membrane showed catarrh. The costal pleura was covered here and there, with wart-like growths of a grey color, connected with one another by bands of connective tissue. The liver was enlarged and contained numerous nodules, the size of a pin head to that of a pea, with a calcified centre. The spleen showed the same lesions, but not to such an extent as the liver. The portal lymph glands were swollen and firm. The omentum contained nodules the size of a walnut, which were calcified at the centre. The mesenteric lymph glands were the size of the fist and showed the same changes as the bronchial glands. The peritoneum was healthy. As a result of these observations the diagnosis of Tuberculosis was made and was confirmed by the microscopic examinations. The tubercle bacilli were plentiful in the cheesy nodules of the lungs and in the nodes of the liver, spleen and affected lymphatic glands. Eighteen preparations were stained according to the Koch-Ehrlich method and B.-tuberculosis discovered in fourteen of them. *Zeitschrift für Veterinärkunde*. No. 2. iii.

WOUNDS OF THE TENDONS.

Army Veterinarian Goldmann.

A young cavalry horse was observed to have a wound of $\frac{1}{2}$ in. diameter on the outside of the near hind cannon, near the fetlock and penetrating between the perforans and perforatus tendons. The wound discharged synovia and its borders were covered by a synovial clot. The hair in the neighborhood was cut off, the wound cleaned and the leg placed in a solution of 2% creolin for the day. In the evening a dressing of iodoform and tannine was applied, under a bandage.

The wound grew worse for eight days; the borders became pale and soft and bled upon the least disturbance. The flowing synovia continued. The ninth day the horse refused his food, for the first time, and would not put the foot to the ground. The borders of the wound were swollen, discolored and hot. There was decided fever; temperature 106, pulse 20. The wound was now treated with strong solutions of corrosive sublimate, injections of a 5% solution of creolin, subsequent tamponning with iodoform and bandaging aseptically.

The horse was given antifebrine (3v per day) and subcutaneous injections of spirits of camphor and caffeine. Two days later it was found down, unable to rise; no appetite; bandage changed, borders of wound not quite so much swollen. The internal treatment was continued. Improvement now commenced, which under the same treatment, led to complete recovery in about a month. *Zeitschrift für Veterinärkunde*. No. 2. iii. 1891.

CURE OF A FISTULA OF THE SPERMATIC CORD BY
INJECTIONS OF IODINE.

Army Veterinarian Christ opened in June of last year, an abscess on the scrotum of a young gelding that had been recently purchased. In spite of the treatment the wound would not heal and continued to discharge until February. A firm tumor had, in the meantime, developed on spermatic cord and had reached the size of a child's head. Injections of Lugal's solution were made in eight different portions of this tumor, but the growth did not seem to be affected by the treatment. Hence, a few days later, the horse was cast for the purpose of extirpating the tumor, when the operator found, much to his own surprise that sloughing had already commenced and the wound had become smaller. The operation was put off and the horse recovered in a short time, without further treatment. *Zeitschrift für Veterinärkunde*. No. 4. iii.

The importation of American cattle into Germany is allowed under the following conditions: They must be unloaded at Hamburg and transported at once, in wagons, to Altona, a distance of about 5 miles. Immediately upon their arrival, they have to be slaughtered, before the eyes of the police (to see that none are taken away) and are then inspected by Veterinarians. Other cattle, which come in contact with those from America are not allowed to leave the spot but are slaughtered at once. That is, our cattle are all looked upon as having been exposed to contagious diseases and are subjected to the laws pertaining to these diseases.

Cesare recommends a 40 to 50% solution of antipyrine, as an hæmostatic. The lung causes a more or less prompt cessation of hæmorrhage from both the large and small vessels by making the

blood thicker without coagulating it, and thus hindering its flow from the vessels. *Zeitschrift für Veterinärkunde*. No. iii.

An ox was recently slaughtered in Frankfort-on-the-Main, whose kidneys were not well mated. The official slaughterhouse scales showed that one weighed 3, and the other 177 pounds.

In the *Chirica Vet.* the following prescription is recommended for constipation of cattle :

R Potassii Bitartrat, ʒ vi
Potass. nitr., ʒ ii ss
Gambogæ ʒ iii.

M. DIRECTIONS: Divide into 12 parts and give one each three hours in a wine bottle of linseed gruel. *Berl. Thier. Wochs.* No. 29. 1891.

SOCIETY PROCEEDINGS.

Joint Session of Ohio and Michigan State Veterinary Medical Associations. Held at Abstract Hall, Detroit, Michigan, July 22, 1891.

The meeting was called to order by Dr. Hawkin's, of Detroit, who in a few well chosen remarks stated the objects of the meeting, and moved that Dr. A. A. Grange, of Lansing, act as chairman. The motion was duly seconded, and the choice made unanimous. Dr. Grange thanked the members for the honor conferred, and stated that they must first proceed to elect a secretary. It was moved and supported that Dr. Gribble, Secretary of the Ohio Association, act as secretary. Carried.

There were present :

Drs. A. A. Grange, Lansing, Michigan; Jos. Hawkins, Detroit; J. J. Joy, S. Brenton, and Jas. Fleming, Detroit; Dr. W. J. Bracken, Fenton; Dr. W. B. Austin, Milford; Dr. J. W. Ferguson, Bay City; Dr. J. C. Whitney, Hillsdale; Dr. Geo. Dumphy, Quincy; Dr. Dell, Ann Arbor; Dr. Thaborne, Lansing; Dr. Smith, Adrain; Dr. A. J. Thompson, Terre Haute, Ind.; Dr. J. W. Wilson, London, Ont.; Dr. J. W. Gibbs, St. Mary's, Ont.; Dr. J. C. Meyers, Cincinnati, Ohio; Dr. J. V. Newton, Toledo; Dr. W. R. Howe, Dayton; Dr. W. Shaw, Dayton; Dr. F. B. Hillock, Columbus; Dr. T. B. Cotton, Columbus; Dr. W. E. Wight, Delaware; Dr. J. Charlesworth, Springfield; Dr. E. R. Barnett, Akron; Dr. C. Christman, Akron; Dr. J. E. Campbell, Alliance; and Dr. Wm. H. Gribble, Washington, C. H.

Communications were read from several members of both Associations expressing regrets at inability to be present.

A communication was read from Prof. Liautard, asking for all papers, proceedings, discussions, etc., for publication in "American Veterinary Review."

Parke, Davis & Co., offered the meeting the use of one of their stenographers, and also invited members to visit their laboratories, etc., at 8 A. M., to-morrow morning. Carriages would be in waiting at the door of this building. Accepted.

Questions received from Dr. Meyers, of Cincinnati, were now read by the secretary and well discussed by the members present. The questions were :

1st. Has any one present had any practical observation as to whether Monorchide's or Cryptorchide's have the power of reproduction? 2nd. Have any of the gentlemen present ever examined the spermatid fluid of such animals and found spermatozoa?

In the discussion the opinion was universal that undeveloped testicles had no power to reproduce.

After closing the discussion of these foregoing questions, Dr. Gribble, of Washington, C. H. O., read a description of four cases of monstrosities, two of foals and two of calves, all of which had been sired by the Dams own Sire.

In the discussion that followed the members did not believe that the breeding had anything to do with the cases described. A poor way to breed, but such cases were purely accidental was the opinion expressed. Next followed a discussion on the use of so-called impregnators. Many members present had used them, but found no good from their use, the universal opinion being, that they were the greatest humbugs ever perpetrated upon horse-owners.

Adjourned to meet at 8 A. M., to visit the manufactories of Parke, Davis & Co.

Wednesday, July 23d., met pursuant to adjournment and taking carriages in waiting visited the laboratories as per invitation, and all were well repaid for their visit.

Mr. S. S. Davis tendered the Association the use of his private yacht to visit the breeding farm, Clareview, thirteen miles up the Detroit river. Invitation accepted. Yacht to be at foot of Third St., at 1 P. M.

We now returned to Abstract Hall, meeting called to order at 10 A. M., with Dr. Grange in the chair, and Secretary W. H. Gribble.

Dr. Shaw made formal report of the death of Dr. Broadus, of Indiana, and the chair appointed Drs. Shaw, Brenton and Dell, to draft resolutions.

The following were offered by the Committee :

OBITUARY.

W. J. Broadus, V. S., who died July 11, 1891, from drowning while bathing, was a young Veterinary Surgeon held in great esteem in the town of Connersville, Ind., where he practiced his profession. He was on several occasions the recipient of high marks of respect from the citizens of his town.

Dr. Broadus was born in Connersville, Ind., in 1865, was educated in the schools of that place, and later entered the University of Indiana, where

he took the usual course, including lectures on Veterinary Science. He graduated from there in the spring of 1888, and the autumn of the same year matriculated at the Ontario Veterinary College.

At this institution he won several prizes and the medal for best examination in Anatomy, and graduated in March, 1890, second in a class of two hundred. He returned to his native place and practiced his profession. He was noted for his pleasing address and his devotion to Veterinary Science.

Although he has only been in active practice a short time, his loss will be greatly felt by the citizens of Connersville.

Whereas, In the death of Dr. Broadus it has pleased Almighty God to remove from our midst a worthy and esteemed friend, and

Whereas, The intimate relations and business intercourse with him have been most pleasant to the members of this association, and the Veterinary Profession it makes it befitting that we publicly record our appreciation of him ;

Therefore Resolved, That in the loss of Dr. Broadus we lose a friend and valued member of our profession, and

Resolved, That with deep sympathy with the afflicted relations and friends of the deceased, we express our earnest hope, that even so great a bereavement may be over-ruled for their highest good, and

Resolved, That a copy of these resolutions be sent to his relatives, and also to the Veterinary Journals.

Committee.

Walter Shaw, Dayton, Ohio.

S. Brenton, Detroit, Mich.

E. Dell, Ann Arbor.

The report was accepted and ordered spread upon the minutes.

An essay on Digestion was read by the Secretary, which had been prepared by Dr. Logan, of Bellefontaine, Ohio. Owing to absence of essayist and short time at our disposal, discussion on his paper was postponed.

Next followed a paper by Dr. A. A. Grange, on the Horse. This was an excellent and highly interesting paper, combining as it did the evolution of the Equine, up to the present specimen.

Dr. Grange was asked to prepare his paper for publication, and furnish it to the Secretary of the meeting for that purpose.

After votes of thanks to those who had assisted us in enjoying the time spent, the meeting adjourned *sine die*, all members who desired, to meet at foot of Third St., at 1 P. M.

Washington, C. H. Ohio.

WM. H. GRIBBLE, D. V. S.

Secretary.

New York State Veterinary Medical Society.—The semi annual meeting of the New York State Veterinary Medical Society, was held at the Parlors of the Grand Central Hotel, New York, on Wednesday August 12, 1891. Owing to the delay of members in reaching the city, the hour for calling the meeting to order was extended.

President Morris called the meeting to order at 10 A. M.

A limited number of members responded to the roll call, and several came in later in the day. Letters and telegrams of regret were received from several members of the society and profession. These were also present: W. Horace Hoskins, D. V. S., Secretary of the United States Veterinary Medical Association; Prof. A. Liautard, New York; Roscoe R. Bell, D. V. S., President of the Long Island Veterinary Association; Geo. H. Berns, D. V. S., ex-President of the Long Island Veterinary Association of Brooklyn; and several other prominent members of the profession from New York and Brooklyn.

President Morris delivered an address of a few well-chosen remarks, explaining why the place of meeting had been changed, that it was done to please members of the profession in the eastern part of the State and especially, New York City and Brooklyn, and to endeavor to get their valuable aid and assistance in promoting the matters pertaining to Legislation, and the good of the society and the profession generally, and to give to those desiring to become members of the society an opportunity to do so. Dr. Morris also said, that he understood the impression had got abroad that this society was simply one for the western and middle part of the State. Now in regard to this, he wanted it distinctly understood, that such was not the case. That it was not an Eastern or Western society. But just what its name implied. *A New York State Society*. Its cause, being to try and benefit every qualified Veterinary Surgeon, in the State of New York, whether a resident of one of the large cities of New York or Brooklyn, or a remote village of the interior. Its intentions, to get all interested and all work together for one grand cause, to elevate the profession to its proper standing, so it will become better recognized by the Local and National Governments, and by the public at large.

The Secretary then read a synopsis of the last meeting, which were approved by the society.

In the absence of Prof. Jas. Law, who came in later, President Morris made a report on what had been done pertaining to Legislation. He said there had been seventy-six votes cast in favor of the bill, when eighty-four votes would have passed the bill, showing that the labors of the committee had been effectual, to a certain extent, and that we ought to keep pushing the matter.

He also repeated that the object in going to New York was to get the assistance of the veterinary profession, of the eastern part of the State, in getting this bill through the Legislature. That there was no reason why it should not be supported from a sense of merit, as it would oblige men who wish to enter the profession after its passage, to do so through a college or university, granting veterinary degrees.

President Morris then made a motion that a resolution of thanks be offered, by the members of the society, to the Hon. Rufus S. Peck, for the services rendered in introducing the bill, and supporting same when brought up for action. Prof. Jas. Law, seconded the motion, voted on, and carried unanimously.

Following is the resolution:

Resolved, That it is the sense of the New York State Veterinary Medical Society, that individually, they owe a debt of gratitude and appreciate

the valuable services rendered by the Hon. Rufus S. Peck, of Cortlandt, for his untiring energy and fidelity in behalf of the Veterinary Surgeons' bill, which he so ably farthured during the last session of the State Legislature, and that we, the representative Veterinary Surgeons' of the State of New York, feel under personal obligations to Mr. Peck, and that we deem it a privilege to express the same to him.

President Morris then said that if any members of the profession, who were present, wished to discuss the merits of the bill, they were at liberty to do so. Quite a discussion followed regarding changes in certain clauses, which were amicably settled.

Prof. A. Liautard suggested that a meeting of all the qualified Veterinarians in New York State be called, for the purpose of making every one acquainted with the merits of the bill. He also suggested that seven members of the Board of Examiners, be chosen from the members of the New York State Veterinary Medical Society, and eight from the members of the profession at large, who hold diplomas from a college or university granting veterinary degrees.

This was made a motion by Prof. Law, and seconded by Dr. Jno. Wende, voted on and carried. The discussion was then continued by Prof. Liautard, Prof. Law, Roscoe R. Bell, D. V. S., of Brooklyn, and several other prominent members of the profession.

At the close of the discussion all agreed that the bill was all that could be desired at present, and that it would meet the approval of the profession at large, and that each and every one of the qualified veterinary surgeons throughout the State, use his personal influence and energy to secure the passage of same.

Adjournment was then taken for dinner.

President Morris called the meeting to order at 2:30 P. M.

The following applications for membership were received by the Censors and placed on file :

R. R. Bell, D. V. S., Brooklyn, N. Y.; Geo H. Berns, D.V.S., Brooklyn, N.Y.; R. S. Huidekoper, M.D.V.S. New York; W. H. Conklin, D.V.S. New York; H. McWhinnie, D.V.S., Troy, N. Y.; Wm. Machon, V.S., New York; L. McLeon, M.R.C.V.S., Brooklyn, N. Y.; Wm. Somerville, D.V.S., Buffalo, N. Y.; G. B. Ackerman, D.V.S., New York; C. B. Comstock, D.V.S., Brooklyn, N. Y.; L. Willyoung, Albion, N. Y.

Prof. A. Liautard was made an Honorary Member by a unanimous vote.

A resolution of thanks was tendered the visiting members of the profession, for the interest they had taken in the matters brought before the meeting, and all were asked to become members of the Society.

President Morris then read a paper on "Tetanus."*

A lively discussion on Tetanus followed, which was entered into by all members of the profession present.

Prof. Law, said that at present there was no doubt as to the germ theory, and stated his experience in several cases. He also said that some cases were known to have recovered without any treatment, while other cases succumbed to this fatal disease with the best medical treatment.

* See page 439, this number of THE JOURNAL.

Prof. Liatard was also of the opinion that the disease was caused by the *Bacillus Tetani*, and when possible, large doses of purgatives, with antiseptic treatment to the wound in traumatic cases, and perfect quietude are demanded.

Prof. Law thought the early use of slings was a great benefit.

Dr. Geo. H. Berns stated his experience in citing seventeen cases he had at one time, which he treated with large doses of purgatives, and one-ounce doses of tartar emetic in the drinking water three times daily, for about a week, then alternated with one-ounce doses of powd. lobelia, and antiseptic treatment of wounds, quietude and slings. And he stated he was successful in making a good recovery of thirteen cases out of the seventeen.

Dr. McWhinnie cited a case which made a good recovery by blistering and hot poultices, applied to the spine and mastoid muscles.

Dr. Roscoe R. Bell said, that although he did not have the affidavit for this, he thought it could be shown to be true, that a horse suffering from a severe attack of tetanus, while being taken from the owner's stable to a veterinary hospital in an ambulance, while passing under the Elevated Railroad, became frightened, and either jumped or fell out of the ambulance to the pavement, and immediately got up and walked home, evidently cured by the shock.

Dr. Willyoung said he had good success by slinging his patient about three or four days and giving large doses of purgatives, followed by large, and oft-repeated doses of solid or fluid extract of *cannibis indica*; so far he had not lost a case out of seven or eight he had treated.

Dr. Wm. Somerville, Jr., thought that the best treatment was perfect quietude, allowing no one to disturb the patient and giving no medicine except a brisk purgative to clean out the alimentary track, and allow nature to do the rest, he had treated cases both with this form of treatment, and with the many ways laid down in our text books, but had better success by leaving the animal to wonderful *vis medicatrix nature*.

Prof. Law said that animals left alone would on the fourth or fifth day be found to be perspiring very much and do so for from twelve to twenty-four hours, when the spasms of the muscles would appear to be considerably relaxed and better, and thought that hot water baths would be beneficial.

Dr. N. P. Hinkley related the history of cases he had treated with steam baths, and stated that, same as in other modes of treatment, some of the patients recovered and others died.

Several other gentlemen continued the discussion of Dr. Morris's paper which brought out several bright ideas regarding the cause and treatment of tetanus, and it was quite late in the afternoon when the discussion closed. As this was only a one day session, and most of the gentlemen present were obliged to return home by the early trains, the reading of the other papers was postponed until the next meeting.

The meeting was then adjourned until the second week in January, of 1892, subject to a call from the Secretary.

NELSON P. HINKLEY, *Secretary*.

Western Iowa Veterinary Medical Association.—Pursuant of a scheme to organize a veterinary association in the western part of Iowa, Dr. S. H. Johnston, of Carroll, issued a call for a meeting of the graduated veterinarians of this part of the State, to meet at that place on the 24th of June, 1891.

Notwithstanding that several had promised to attend, when the time appointed arrived, there were but two present, Drs. S. H. Johnston, of Carroll; and G. A. Johnson, of Odebolt.

Not wishing to let the matter drop, they drafted a constitution and by-laws, and appointed the following officers: President, Dr. S. H. Johnston; Vice-President, Dr. Gibson; Secretary and Treasurer, Dr. G. A. Johnson; and set August 8th, 1891, as a date for a second meeting, at which time the proceedings of the June meeting would be presented for adoption.

G. A. JOHNSON, *Acting-Secretary.*

CARROLL, Ia., Aug. 8, 1891.

Second meeting of the Western Iowa Veterinary Medical Association. Meeting called to order by Acting-President Johnston.

After some slight changes in the constitution and by-laws, the proceedings of the June meeting were adopted.

Moved by Dr. Johnson and seconded by Dr. Gibson, that the president procure a list of service-fees from the Ontario Veterinary College, and one from the Iowa State M.D. Association, carried.

After some further routine business, Dr. G. A. Johnson, read a paper on "Open-Joints," and a "New Remedy," which elicited a lively discussion, after which the meeting adjourned to meet again at the call of the secretary.

This will be but a small association of a dozen or so of members, as that is about the number of graduated veterinarians in this section of the State. The following are the members at present: S. H. Johnston, of Carroll, President; J. I. Gibson, of Denison, vice-President; G. A. Johnson, of Odebolt, Secretary-Treasurer. Also L. A. Thomas, of Atlantic; and S. Stewart, of Council Bluffs.

There will probably be several more applicants at the next meeting.

G. A. JOHNSON, *Secretary*

Western Pennsylvania Veterinary Medical Association.—A number of graduate veterinarians of Pittsburgh and vicinity, met several times at the office of Dr. J. C. McNeil, No. 26 Fourth St., and finally on July 24th organized the above named association, and elected the following named officers to serve for one year, viz:

President, E. J. Carter, V. S.; Vice-President, H. F. Doris, D. V. S.; Secretary, James A. Waugh, V. S.; Treasurer, James C. McNeil, V. M. D.; Directors, H. S. Richards, V.S. Charles Falconer, V.S. and C. Z. Laberge, V. M. Monthly meetings will be held regularly on the first Saturday of every month.

James A. Waugh has promised to read at the next meeting a paper entitled "Electrical Accidents to Domestic Animals."

JAMES A. WAUGH, V.S., *Secretary.*

Veterinary Medical Association of New Jersey.—The 23d regular meeting of the New Jersey Veterinary Medical Association, was held in Saenger Hall, Newark, New Jersey; on Tuesday August 13, 1891. The meeting was called at 12 o'clock (noon), by the President, Dr. R.R. Letts. The Secretary called the roll, and the following members were present :

Drs. W. B. E. Miller, Camden; R. R. Letts, Hoboken; J. W. Hawk, Newark; J. C. Dustan, Morristown; S. Lockwood, Woodbridge; W. H. Cooper, Jersey City; L. P. Hurley, Hopewell; B. F. King, Little Silver; J. Kehoe, Lyndhurst; H. W. Rowland, Newark; W. Runge, Newark; R. O. Hasbunck, Passaic; M. M. Stage, Dover; J. Gerth, Jr., Newark.

The minutes of the last meeting were read and approved. President Letts made a short address. The Secretary and the Treasurer read their reports, and the following applications for membership were accepted :

Drs. Eugene Britten, Long Branch City; Hugh Exton, Washington; E. W. Schuppan, Jersey City; F. Lippencott, Swedeboro.

Dr. Miller reported for the Board of Censors, and recommended Exton, Britten, and Schuppan, who were elected members. Miscellaneous business was then taken up.

A number of letters were read from veterinarians, and from veterinary associations. An able address was made by Dr. W. H. Hoskins, of Philadelphia.

Camden was selected as the place for the next meeting.

W. H. COOPER, *Secretary.*

New Jersey State Veterinary Society.—The annual meeting of the New Jersey State Veterinary Society, was held in New Brunswick, Thursday August 6, 1891, in White Hall Hotel.

The meeting was called to order at 2:30 P. M. President E. L. Loblein, occupying the chair. On roll call the following members answered to their names :

Drs. Jos. Hopkins, J. C. Corlies, J. N. Krowl, E. L. Loblein, W. H. Lowe, E. R. Mercer, L. R. Sattler, A. T. Sellers.

The minutes of the previous session were read and approved. The address of the President followed. The Board of Censors recommended the admission to membership of the following : Drs. E. R. Ogden, E. C. Batten, W. F. Harrison, and T. H. Ripley. The report was received and the doctors named were duly elected to membership.

The following applications for membership were received and referred to the Board of Censors for action : Drs. E. Landes, of Camden; W. Gray, of Newton; E. D. Bachman, Phillipsburg; J. M. Whittpan, Jersey City; J. P. Lowe, Paterson; S. C. Tremaine, Bridgeton.

The election of officers resulted as follows : President, Dr. James Hopkins; Vice-President, Dr. W. H. Lowe; Treasurer, Dr. A.H. McIntosh; Secretary, Dr. A. T. Sellers. Board of Censors : Drs. E. R. Mercer, J. N. Krowl, E. R. Ogden, E. C. Batten, and E. L. Loblein.

The newly elected President was escorted to the chair, and made an address of interest to those present. The following resolution was then adopted, which is intended to probe the supposed existence of contagious

pleuro-pneumonia in and around Newark, where it is reported cattle are being condemned because of the disease, and afterward the meat sold to the public for food :

Whereas, The alleged existance of contagious pleuro-pneumonia among the cattle around Newark, N. J., and the action of the Bureau of Animal Industry, in quarantining and destroying herds, has induced much hardship among the small owners of cows, and

Whereas, Many complaints have been made to veterinarians by owners of cattle, that no such disease exists in that vicinity, therefore be it

Resolved, That this society shall appoint a committee of five to investigate the methods pursued by the agents of the Bureau of Animal Industry, and if deemed advisable have a special meeting called to consider the action necessary.

Drs. E. C. Batten, E. L. Loblein and L. R. Sattler, were appointed essayists for the next meeting.

Drs. E. R. Mercer, W. H. Lowe, and James Hopkins, were selected as delegates to the next Annual meeting of the United States Veterinary Medical Association.

The essayists for the meeting being unavoidably absent, several hours were consumed in discussing Colic in its different forms, and its treatment. Many interesting and valuable points were brought out, notably the Eserine treatment of flatulent colic. Congestive Colic, the newly recognized form, received lengthy attention of the greatest value to those present. The absent members missed a good meeting.

At six o'clock P. M., we adjourned to the Banquet Hall, where an elegant repast was served.

Paterson was selected as the next place of meeting.

A. T. SELLERS, *Secretary*.

BOOKS AND PAMPHLETS RECEIVED.

American Veterinary College, New York. — Seventeenth Annual Announcement, Session 1891-1892. Catalogue, 1890-1891. List of Graduates to 1891, and Report of Hospital Department, 1890-'91. This announcement shows a steady augmentation in the facilities of instruction, both theoretical and practical, which are offered to the students, and in the number of students in attendance. There has been a decided increase of the latter in the last few years. The next Session commences October 5th, 1891.

Ontario Veterinary College, Toronto Canada. — Annual Announcement, Session 1891-'92, also names of the graduates who hold the Diploma of the Council of the Agriculture and Arts Association. The new buildings are described, and are represented in several illustrations. A list of the graduates shows a large number from the United States. The next Session commences October 21st, 1891.

Bulletin Société Linneenne du Nord de la France. Amienes

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RACHITIS.*

BY W. L. WILLIAMS, V. S.

Rachitis is one of the most widespread maladies to which the animal kingdom is subject, and it may well be doubted if there exists a mammal or bird which is not liable to this disease.

It has been recorded in man, in all our domesticated animals and birds, and in many of the wild animals and birds confined in zoological gardens. So far as we can learn we have no record of the disease among undomesticated and unconfined animals or birds.

The etiology of the disease has so far baffled all investigations, although some of the conditions necessary to the development of the disease have been experimentally demonstrated. It is one of the oldest diseases known to medical literature, having been described by Vegetius.

The malady has received the greatest attention at the hands of writers on human medicine. This has been extremely unfortunate for medical science in general, inasmuch as with this narrowness of the field of observation, errors in our conclusions are apt to creep in, which in a broader area of study would be recognized and eliminated. Still more, we lose by this means of consideration by excluding a large volume of material for study, which is far more available than the disease in man readily offers, either ante or post-mortem.

* Read before the United States Veterinary Medical Association, September 16, 1891.

Much difficulty has been thrown in the way of the study of rachitis in the lower animals by the extremely vague, erroneous and perplexing names under which it has been designated in its various manifestations and by various writers.

In the Mississippi valley and probably over the greater portion of the United States, solipeds offer the most abundant, available and richest field, for the study of the malady, and certainly in no animal have English veterinary writers succeeded in more thoroughly confusing their readers, and in drawing their attention from rachitis, to view under some other more mysterious name this disease under its different forms of manifestation.

One of the chief aims of this paper will be to draw your attention to rachitis as seen in the horse, and thereby enlist your active study in what we believe to be a rich and promising, although sadly abused field. The classification of rachitic diseases has long been a matter of great controversy, and no doubt many of you will dissent to that here proposed.

We find described in man two diseases, which if not identical are certainly very closely allied—rickets or rachitis, and mollities ossium, or osteo-malacia. Trousseau (1) asserts that the two are identical except in age of patient, while Bristowe, (2) although admitting their strong resemblance, believes that the details of anatomical changes are quite different. Without pointing out these differences, however, he recapitulates the symptomatology, morbid anatomy, pathology, course, termination and therapeutics of rickets, and leaves the reader at a total loss as to his reasons for his classification and necessarily the impression that the two descriptions are of one and the same disease, with the difference that rachitis occurs in adults and almost exclusively in child-bearing women.

The difference in the age of the patient seems at present to be the only tangible ground for the differentiation of these in man.

In the lower animals Prof. W. O. Williams, (3) fails to draw any distinction between the various forms of constitutional bone diseases which he describes in such a way as to assist the student in differentiation between them.

Friedberger and Frohner, (4) distinguishes osteo malacia and

(1) Theory & Prac. Med., Bristowe, p. 809.

(2) Ibid., pp. 808-809.

(3) Prin. & Prac. Vet. Surgery, pp. 178-199.

(4) Spec. Path. und Therap. Zweite Auflage. Band II. S. 21.

rickets, by the fact that the former is a resoftening of the osseous system of mature animals in consequence of a resorption of lime salts, whereas the latter is a persistence of the soft condition owing to imperfect calcification.

They admit, however, that in many respects they are identical. They occur simultaneously in the same herd, and experimental research shows that the two diseases are developed in the same manner, and by the same dietetic restrictions, and that the anatomo-pathological differences are those due to a similar if not identical cause acting upon bones which have undergone different stages of development.

It must be admitted by all that rachitis does not consist merely in a want of calcification, but in an actual de-calcification of the bones already considerably developed, so that a one year old foal may have lighter bones than at time of birth; so that both diseases or phases of disease must be due, not alone to a suspension of the calcification process, but to de-calcification of the bone already formed as well.

Prof. Dieckerhoff, fails to give so clear a conception of his idea as to the identity of these two diseases.

We find described quite commonly by veterinary writers several other diseases of domestic animals which if not identical are certainly closely allied to rachitis, such as osteo-porosis, articular rheumatism and partial dislocation of patella.

Friedberger and Frohner, (1) who are certainly correct in their position, classify osteo-porosis with rachitis, as one and the same disease, while Dieckerhoff (2) and Prof. W. O. Williams, (3) dissent and maintain that it is a wholly separate affection. Under the head of partial laxation of the patella, Prof. W. O. Williams (4) describes a disease of young animals attributed by him to grazing on hilly pastures, which in symptoms and course is quite identical with a malady happening not unfrequently in young animals grazing upon the level prairies of the Mississippi Valley.

While, it is certainly undesirable to group together diseases under one head which are essentially dissimilar in their etiology and pathology, it is equally unfortunate to dissociate phases of diseases due to the same fundamental causes, and offering essentially the same characters.

(1) Spec. Path. und Therap. Zweit. Auflage.

(2) Lehrbuch. Pathol. u Therap.

(3) Prin. & Prac. Vet. Surg.

(4) Ibid.

In general we would say rachitis is a constitutional disease, affecting principally the osseous system and cartilage characterized usually by an insidious chronic course, with a softening of the bones, increase in size with a marked decrease in the weight of earthly constituents owing to the resorption and excretion of earthy matter, especially of the phosphates and the salts of lime.

The affection occurs mainly in young animals although no age is exempt. The symptoms vary to some extent with the species of animal, the violence of attack, age of animal, etc., beginning usually with a general disorder of the nutritive functions of the body, probably a considerable degree of emaciation, a well-marked lassitude, visibly increased by exercise. In moderately severe cases a well-marked disinclination to move soon becomes apparent, and the patient ceases to join in the play of its companions. In lower animals the temperature is generally slightly, if at all elevated, while in children it appears, there exists a reasonably well-marked fever, with a sensation of heat and with sweating, especially of the head and neck.

There is an increased tendency in all rickety animals to assume the recumbent position, especially well marked in pigs and calves; less evident, however, in horses which, as is well known, naturally maintain the standing posture both in health and disease to a much greater extent than other animals.

Concurrent with or closely following these symptoms are other phenomena of a grave character. The general stiffness, the hobbling gait, becomes more intensified making it next to impossible in many cases for the animal to move, and it will do so only under the goadings of hunger, thirst, or extreme punishment. This stiffness is generally universal over the entire skeleton, but in many cases in the horse, especially those well advanced toward maturity, the cervical region seems to be the chief seat of pathological change.

In many cases this rachitic inflammation of the neck develops quite rapidly, more so than most symptoms of this affection and soon attain an exalted degree. The patient holds the head and neck perfectly rigid as though the vertebræ were all ankylosed, the nose poked out like in poll-evil, the gait extremely stiff and careful, and in turning the animal does so very carefully and without bending any part of the spinal column. Any attempt to forceably bend, raise or lower the head, causes evident pain and the animal perhaps with a groan, attempts to escape punishment by stepping backwards promptly. Some

cases in this form are so severe that the animal is unable to get its head to the ground to eat or drink, nor can it reach to any height above its ordinary level to secure hay or other food from a high rack.

In all species of animals and in man there is a well marked tendency to enlargement of the long bones at their distal epiphyses, especially of the radius and tibia, and in man and those lower animals having complete ulnae and fibulae, these are affected simultaneously. These epiphysial enlargements are characterized temporarily by lameness and pain on pressure which in time may subside in one bone to appear elsewhere in another. In horses the lower ends of the cannon bones are frequently involved in this way, and occasionally we find the os suffraginis or os corona affected with a ringbone-like enlargement. In foals one to three years old there is at times noted inflammations of the small bones of the hock, especially of the cuneiform bones, resulting in large bony exostoses (spavins) usually affecting both legs and symmetrical in size and form.

In young foals æt. three to six months, while in good general condition there frequently develops a rachitic hydrarthrosis especially of the stifle, more rarely of the tarsal or carpal joints, without in many cases evincing other evidence of disease. Sometimes but one stifle is affected, at other times both, at first usually unassociated with lameness and may so remain throughout its course or gradually developing, the amount of synovia increasing, the fluid pushing the patella forward floating it away from its femoral groove and allowing it to slip over the condyle outwards during the flexion and slipping back in its groove with a snap during extension. In some cases the extensions of the synovial membrane about the peroneus and other muscles passing down over the stifle joint became greatly distended with synovia throughout their entire extent.

This synovial distension with patellar displacement cause the vasti muscles to assume a tense rigid appearance resulting later in atrophy, while the flexor tendons become somewhat contracted, causing knuckling over at the pastern. At the same time, owing to the extra weight thrown upon the well-nigh equally affected front limbs in order to relieve the posterior legs, causes them to bend forward at the knee and pastern joints, resulting in more or less severe contraction of the flexor tendons, occasionally to such a degree that the leg cannot be straightened sufficiently to bring the heel to the ground. The entire bony skeleton suffers in every

part from enlargement and rarification, especially noticeable in the epiphyses or the long bones and in the flat bones of the head and face. In the horse this enlargement of the bone is usually best observed in the living animal in that part of the superior maxillary bone bounded by the superior manillary spine, the infra-orbital foramen and the nasal bone, which by enlarging renders the ridge less distinct. Frequently also the thickening of the inferior maxilla is quite distinct. After death the region showing the greatest swelling is usually the anterior part of the superior maxillary bone, which during life is hidden to a great extent from observation by the super-imposed tissues. This enlargement and thickening in the bones of the head and face is quite universal in rachitis in men and animals. The cranial bones are arrested in development in young animals and retain something of the foetal type, this being specially notable in children and foals.

Nervous derangements have been noted in children, consisting in laryngismus stridulus, convulsions and hydrocephalus. J. Bland Sutton, F. R. C. S., in a highly interesting article on "Rickets" in Monkeys, Bears and Birds, *JOURNAL OF COMPARATIVE MEDICINE AND SURGERY*, Vol. X. p. 10, relates a case of blindness in a rickety Assyrian bear due to pressure upon the optic nerve by the enlarged surrounding bony tissue. In one foal I observed blindness with apparently some degree of hydrocephalus, and a general want of mental activity was observed.

Deformities of the bony skeleton due to the softened condition of the bones occur in the more advanced stages of the disease and depend largely in form and degree upon the habitual attitude of the patient. In children the deformities are largely those of the spinal column, thorax and lower limbs, and the position of the spinal column being largely upright leads to curvatures in various directions. In the horse the normal position of the body tends to confine spinal displacement mainly to a downward curvature (lordosis) but in rare instances we find an upright curvature (kyphosis) or a lateral curvature (skoliosis) or a union of the two latter (kyphoskoliosis). In pigs and calves the upward spinal curvature usually takes place. Fractures varying in degree are quite prone to occur in almost any part of the skeleton, sometimes complete with marked displacement, at others only partial with bending of the bone (green stick fracture) and may result from struggling when cast or confined in attempts to rise from the recumbent posture in the course of ordinary travel, or what we might term spontaneously from the contraction of muscles.

In the foal these fractures are seen most commonly in the dorsal or lumbar vertebræ during attempts to rise, and result in complete paralysis of the posterior parts necessitating destruction of the animal. Partial fractures of the ribs which occur apparently wholly without accident but due to muscular contraction are quite common and can usually be discovered only by the post-mortem. (See Fig. I, b.) Similar fractures, without apparent cause, occur of various bones, a very good illustration of which we find in (Fig. I, a.)

In work horses fractures of the bones of the legs are likely to occur suddenly while the animal is at ordinary labor, resulting in marked displacement and generally necessitating destruction of the animal. A lack of ossification and even resorption of osseous tissue has been noted in the cranial sutures of children, and we apparently have the same result to a certain degree in (Fig. I, d.,) the case of a foal. The changes in the nasal passage are of such an extent as to cause in some animals a marked difficulty in respiration.

This is recorded as being quite common in pigs and is denominated "*Schunffelkrankheit*" by the Germans and the same difficulty is not very rare in rachitic foals. Friedberger and Frohner attribute this dyspnoea to thickening of the bones bounding the nasal passages, and this is doubtless largely true especially of the turbinated bones, but in some cases at least the dyspnoea is due rather to a thickening of the nasal septum by deposit between the two cartilagenous laminae of an abundant soft, spongy tissue, which increases the diameter to such an extent as to largely occupy the nasal passages. This pathological condition is well shown in (Fig. III, b.)

In man and animals dentition is delayed or at times even suspended, and the teeth already erupted become loosened in their sockets, pushed out of their regular positions and may even drop from the mouth. In young patients the growth is generally impeded, emaciation is present in various degrees, and in case of recovery the individual usually retains a more or less dwarfed appearance with short and somewhat crooked legs. When recovery takes place the deformities usually, for the most part remain, rarely interfering with the usefulness of the animal, although much depreciated in value owing to the unsightliness of the deformities. Changes in the form of the pelvis are likely to occur which may render females more or less unable to successfully pass through parturition.

Of the internal organs enlargement of the liver and spleen constitute the chief pathological changes recorded. The

bowels are somewhat irregular, and in those animals in which phosphates are normally excreted by the kidneys, we find the urine contains an excess of them, mostly in the form of calcium phosphates, while in solipeds, in which the phosphates do not normally appear in the urine, we find this replaced by a superabundance of calcium carbonate, giving the urine a very thick muddy consistence.

Death from rickets is usually induced by bronchitis, bronchopneumonia, asthenia, or in the lower animals to fractures which demand destruction.

Rachitis in animals is largely confined to certain definite localities or environments. We have noted on three adjoining farms in Central Illinois no less than twenty cases in horses during a practice of twelve years, and outside of this small area during the same time, taken altogether we have not observed an equal number. Other practitioners record similar experiences, thus indicating that there are local causes capable of inducing it, while the occasional appearance of isolated cases indicate that the same or similar conditions exist generally to a minor degree.

After recovery there is in all animals a tendency to hyperossification and hypertrophy of bone, and in some cases cartilages which do not ordinarily ossify, do so quite completely after rachitis.

CASES IN PRACTICE.

A. An unusually large, heavy-boned muscular, vigorous, full-blood Norman colt, age at present $3\frac{1}{2}$ years. He was unusually robust up to about four months of age, when a synovial distension of one stifle appeared, soon followed by similar changes in the other leg. The enlargements slowly increased, lameness in both stifles supervening within a few weeks, coupled with some degree of emaciation and lassitude. The lameness gradually increased in severity until eight or ten weeks after the inception of the malady he could not rise without assistance, but once upon his feet could manage to walk about the stall with difficulty, being quite rigid in his limbs and back. For three months the owner assisted him to his feet two or three times a day. Emaciation advanced rapidly during this time, but the growth of the foal suffered but little interference. The patellæ were soon floated out beyond their groove so that they could readily pass out and in over the external condyles of the femur. The distended synovial sacs were tense, somewhat hot and tender. The relaxation of

patellar ligaments permitting luxation of patellæ, with accompanying contraction of the vasti muscles, caused the stifle joints to be held in a peculiar extreme extension, with flexion of the hock and very distinct flexion and knuckling of the fetlocks. The anterior limbs suffered similarly as the disease advanced, and the elbow joint became the seat of similar changes observed in the stifles, while the flexor tendons contracted to such a degree that the foal walked on the anterior part of fetlock joint.

The appetite was good, temperature about normal, bowels somewhat constipated. At about the ninth or tenth month of age, or the fifth or sixth month of disease, the symptoms slowly abated, the colt gradually regained flesh and spirits, the synovial distension of stifles declined, while the ends of some of the long bones apparently thickened, and the bones of the head and face became distinctly enlarged. The contractions in the flexor tendons of the fore-legs persisted, and at about fourteen months tenotomy was performed. From that time he has gradually improved, and is now a horse of about 1750 lbs. weight, which is probably 300 lbs. less than he would have attained barring accident.

He now has every appearance of health and vigor, has served mares readily and probably successfully, is reasonably active in his movements, although showing some degree of awkwardness and immobility; his stifles are still extended, the vasti muscles apparently stretched and the patellæ still occasionally slip to and fro over the external condyle. There is some bending forward of the carpal joint and apparently an increase in the normal curvature of the radius, probably also of the metacarpus.

Some two years prior to the affection in this colt, a highly bred trotting mare, aged at the date of disease four years, property of same owner and kept on same premises as the above, developed extreme lardosis or sway-back, within a very few months, without revealing other symptoms of disease except slight stiffness of gait and a general lassitude. She made a prompt recovery, the deformity persisting.

In the year following that in which the colt became affected, there occurred on the same farm no less than four cases of synovial distension of the stifle in sucking foals, some becoming quite lame, one or two suffering from emaciation, and in several there was partial dislocation of patellæ. Three of them have recovered, the other has markedly improved.

During the following season in 1890, one mild case of synovial distension at stifle appeared, which has, it seems, recovered. At

present one of the colts of the year's crop in which four cases of synovial distension of stifle occurred, but not included in the four affected, he having always appeared in the best of health, has recently developed a tendency to hypertrophy of the splint bones, especially of those of the fore-legs, which now extend down to the enlargement at the extremity of the metacarpal bone, and are nearly one inch in thickness, giving the fore limbs a very peculiar aspect. The animal is in perfect health apparently, and moves naturally.

Recently a four year grade draft mare, in the same herd, has become extremely stiff and sore in her neck, walks stiffly as though in pain, maintains the entire spinal column in a straight line, neck especially held quite rigid with nose poked out. Temperature slightly elevated (102 F.), pulse normal, appetite good, emaciation slight. Any attempt to forcibly raise, lower or bend head or neck to right or left, causes great pain, and the animal starts backwards to escape punishment. Enlargement of the facial bones is progressing slowly. The urine from this mare, and several of the colts taken during the active stages of the disease, show uniformly a large excess of calcium carbonate.

This group of cases on the same farm, and under the same management, demonstrates to an excellent degree, the variations which this disease may assume. The first case serves as a connecting link between the rather common, mild rachitic synovial distension of the stifle joints in young foals, and the enlargement of the facial bones known to English veterinary writers as osteoporosis. The enlargement of the facial bones in this animal is now so evident, that no one could avoid so classifying it.

B. A full-blood French draft foal, age about eight months; location the adjoining farm to *a*. When first observed the foal was down and unable to rise, assisted to its feet, it was unable to stand. There was complete paralysis of posterior parts with the appearance of broken back. The foal was destroyed, and an autopsy revealed a transverse fracture of one of the lumbar vertebræ with dislocation and pressure upon the spinal cord. The bones throughout the entire system were soft, porous and easily cut with a knife. Prior to my visit two or three foals of same age had succumbed in the same manner, doubtless from fracture, and several more died after my visit.

These weanling foals were all kept in a warm basement not greatly crowded, and were highly fed. All were unthrifty,

emaciated, lame in various joints, stiff, some with arched backs, others the opposite. The disease was not confined at this date to weanling foals, but affected as well yearlings and two-year-olds kept in another part of the stable. One two-year-old colt exhibited the disease mainly in his hocks in the form of large bone spavins, causing considerable lameness and not yielding to treatment, while others of the same age showed principally the enlargement of the facial bones. Some seven or eight out of about twelve of the year's colt crop succumbed to the disease, the others recovered with so much deformity and interference with development, that they were of little value for breeding purposes for which they were designed. Of the older colts some four or five yearlings and two year olds became affected with, as nearly as remembered, one death, the others recovered with persistent deformities, which largely diminished their value. The disease had been seen on the farm before, but there had been a lapse for several years. Two or three years prior to our date of observations, we saw on the same farm a yearling colt with supro-lateral curvature of the spine (Kyphoskoliosis), which made a good recovery with slight deformity and sold at good price for breeding purposes. Subsequent to the time above mentioned, about 1885, no cases have been observed on this farm.

C. An eight months common filly, of light breed, on a farm adjoining that on which the group marked *a* was kept. She appeared in her usual health until about three months old, when she ceased to grow, seemed unthrifty, would not join in the play and gambols of its associates. Its movements were slow, careful and indicative of weakness. Within a few weeks extreme lordosis was developed so that the middle of the back had sunken downwards fully five inches. When about eight months old the animal was procured for special study, and was led with difficulty about two miles, arriving in an exhausted condition. The temperature was slightly elevated, the appetite fair, the bowels somewhat constipated, urine scant and thick, and contained an enormous excess of calcium carbonate. There was extreme emaciation, with enlargement of the abdomen. The respirations were hurried and difficult, the dyspnoea being in part nasal, largely pulmonary. A white froth escaped from the nostrils in considerable amount. The lungs were somewhat dull on percussion throughout, especially marked at their interior border. Auscultation revealed

slight broncho-pneumonia. The exertion required of the foal in traveling from the farm to the infirmary seemed to act unfavorably upon the course of the disease, and the patient rapidly grew worse, the pulmonary symptoms becoming aggravated until in about one week, it was found dead one morning upon entering the stall. The extreme lordosis so evident during life was not distinguishable after death—the relaxation of the muscles and relief from weight had caused the spinal column to assume its normal posture.

Autopsy revealed in the main : First, a well defined thickening of the flat bones, especially of the face (Fig. I, d), and inf. maxilla (Fig. II, a), pathological phenomena which thoroughly identified it in this respect with osteo-porosis.

Second, curvature of bones as shown in one of the asternal ribs, (Fig. I, c,) antero-posterior curvature and (II, c,) a minor degree of lateral curvature of the same rib, irregular toward the head and an anterior-posterior curvature of the radius beyond that observed in health.

Third, Fractures of an apparently spontaneous kind and incomplete character (green stick) of three ribs. Two asternal on opposite sides, one sternal as shown (in Fig. I, b), and also a fracture of the left ramus of inf. maxilla, as seen in (Fig. II, a.) This bone also shows slight lateral curvature.

Fourth, an extremely light, porous fragile condition of the entire bony skeleton.

Fifth, enlargement of the liver.

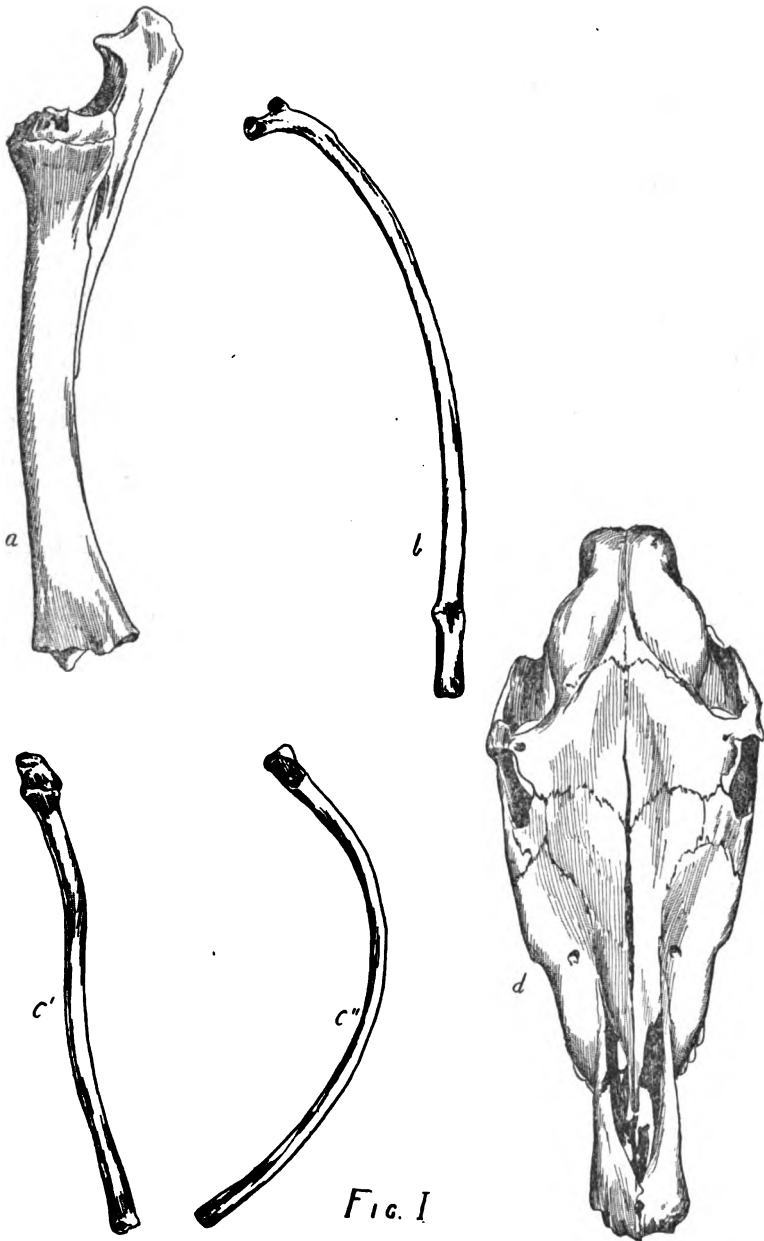
This case illustrates, at one and the same time, with equal strength, rickets and osteo-porosis.

D. A well-bred trotting filly, age, at beginning of observation, 2½ years, when she exhibited a marked stiffness and soreness of the neck, so that she could with difficulty lower her head sufficiently to graze. The neck could not be bent sideways nor the head elevated beyond the straight line without great pain to the animal.

Repeated severe blisters over the course of the cervical vertebræ caused a slow subsidence of the symptoms, which however, never fully disappeared.

Some months later, in addition to progressive emaciation, the animal exhibited signs of dyspnœa, when she began to gain in flesh and spirits.

An examination of the nostrils showed the cause to be mainly a thickening of the septum nasi, and after a brief wait succeeding



tracheotomy, the septum, (Fig. III b), was removed as high as practicable.

It was found to be almost one inch in thickness in the lower part of the nostril, the two layers of cartilage having been pushed apart by a spongy new formation. Higher up in its extent the cartilages approached each other, and the septum resumed about its usual thickness. Within a few days the tracheotomy tube was removed, and the case seemed to progress rather favorably for a time, but after several months the dyspnoea returned and tracheotomy was again called to our aid, when we found to our surprise, that at the seat of our former operation, the trachea was thoroughly ossified for several inches and the tube much narrowed, necessitating a lower operation, which afforded but little relief, and the animal succumbed a few weeks later. Late in the disease, thickening of the facial bones had progressed to a decernable degree, and when after death, prepared for preservation, it exhibited the appearance delineated in (Fig. II, b.) Autopsy further revealed old fractures of two or three ribs.

E. A well-bred roadster colt, age now, three and one-half years. He is very large, muscular and well developed, and has at no time been debilitated nor emaciated, neither has he exhibited any lassitude or disinclination to play with his associates. He became lame when about three months old and exhibited hard osseous tumors at the lower epiphyses of the metatarsals and metacarpals, first appearing in one leg, remaining a few months, disappearing slowly and imperfectly only to re-appear in another. Later, the lower epiphyses of radii and tibiae, suffered in a like manner, giving rise to considerably sized epiphysial enlargements, which, like those of the cannon bones have slowly disappeared. The last appearance of lameness was in one fore foot, where it has persisted now for more than a year.

This series of cases demonstrate reasonably well the symptoms and progress of rachitis in the horse and we believe serves to connect into one group, in a tangible manner, the varied phenomena observed in different individuals, and which, by various writers, have been separated into different affections.

In order to facilitate comparison to a certain degree between rickets in man and the horse, the celebrated Jadelot cranium (*) is here sketched (Fig. III, c.) which although an extreme specimen, bears a striking resemblance in many essential points to the rachitic facial and cranial bones often seen in our patients.

* JOURNAL COMPARATIVE MEDICINE AND SURGERY, Vol. X, 1889.

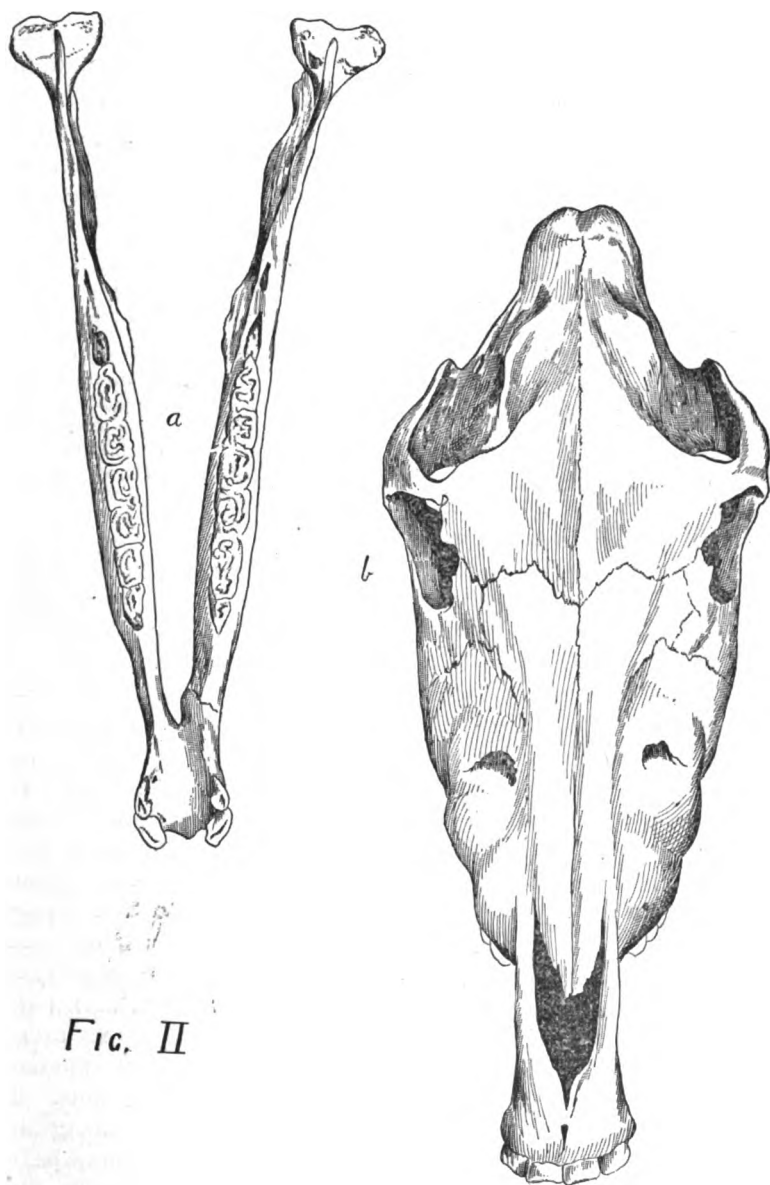


Fig. II

Fig. III, a. represents the healthy head of the horse.

The differential diagnosis of rachitis in the horse is comparatively easy. It may be confounded: First, in quite young animals with pyo-septhaemia or omphalo-plebitis of new-born foals, which usually has a more or less clear history, develops usually within a few days or weeks after birth, usually shows some slight indication or infection at the umbilicus, the joint complications are more sudden and severe and the epiphyses of the long bones are not affected.

Second, in animals of diverse age, accompanied by lameness or stiffness of neck, with articular rheumatism which is more sudden in its outset than rachitis, more prone to metastasis and affects the joint, not the epiphyses.

Third, in cases of facial enlargement, with odotomes, or other dental affections, which, unlike rachitis, are seldom symmetrical and rarely show in that part of the face most prone to rachitic change, are usually sharply defined in outline and, except respiration or mastication is interrupted, they rarely affect the general condition of the animal unfavorably.

Fourth, in those cases of cervical rachitis, with cervical articular glanders, which is more sudden and severe in its outset and usually exhibits laryngeal or pulmonary symptoms (cough) or farcy.

The etiology of rachitis is not yet definitely determined. Climate, altitude, geological formation, species, breed, food and housing seem incompetent to prevent it as sporadic cases appear everywhere. And yet there is something about food and environment which makes disease common in one locality rare in others. It has not been recorded in free wild animals and birds while those confined in zoological gardens suffer very seriously from its ravages. In the crowded tenements of London it proves a veritable scourge among the children of the poor and yet it appears although far less rarely, in the homes of the wealthy and under the best known sanitary regulations. It seems also that in those localities where rickets prevails, that it confines its ravages mainly to one species of animals. In one locality it apparently affects mainly cattle, in another, pigs, in another, colts. The character of the available literature gives no clue to the grounds for this apparently peculiar condition. Possibly it may be due to the fact that the disease attacks mostly that species of animal to which most attention it paid in a given locality and hence a higher state of domestication and more confining environments.

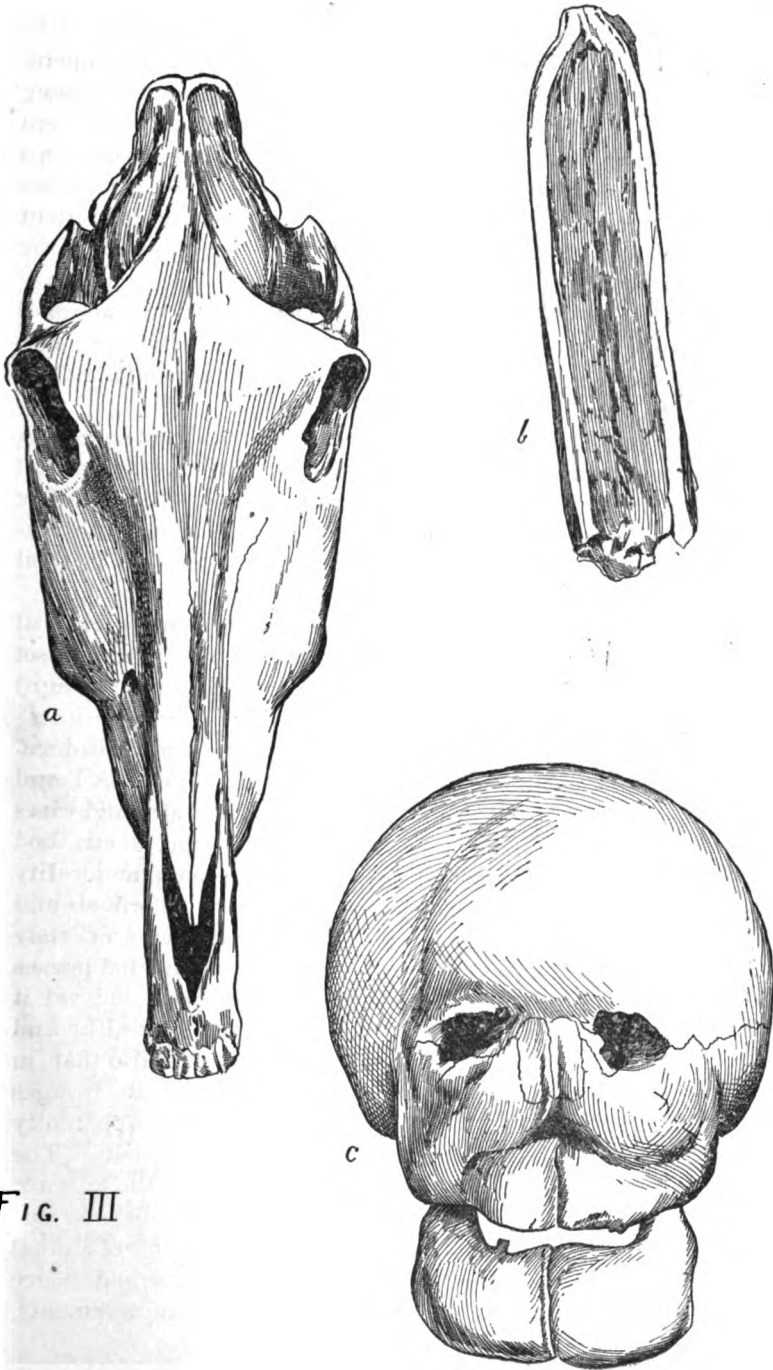


FIG. III

Roloff and others have produced the disease by experimental feeding of animals on food deficient in lime and phosphorous, thus producing experimental lime starvation, while on the other hand the Kleie or Hirsch-Krankheit of the Swiss veterinarians is brought about by feeding bran or pollard which is excessively rich in the earthy constituents of bone, and the rachitis of horses in central Illinois cannot be referred to a lack of these earthy salts where they get an abundance in both food and water.

Another evidence that it is not phosphorous or lime starvation is the fact that in the active stages of the disease an extraordinary amount of these salts are being constantly eliminated as calcium carbonate in the urine and the phosphates probably in the feces in solipeds and possibly other animals.

We must consequently conclude that the disease is not so much due to lime starvation as to mal-assimilation of the ingested salts along with a solution and resorption of the osseous tissue already formed. The exact character of this process is the most stubborn and yet the most important question now confronting us in the study of this malady. The ætiology of the disease being in doubt, renders our efforts at therapeutics at least uncertain, if not impotent. Many writers have commended the administration of phosphates, but when the excretory organs are already overtaxed in throwing out these salts, it seems folly to furnish more to be excreted, and in fact, clinical experience has failed to discern benefit from this line of treatment. Cod liver oil has long been considered the best remedial measure known although its action seems not to be understood. Locally much can be done at times to relieve urgent or unfavorable symptoms. In cervical rachitis, vesicants and cautery seem to afford relief. Tenotomy may prove necessary in case of contractions of the flexor tendons. Iodine blisters may exert a favorable influence in checking bony deposits during the convalescing stage.

THE TRANSATLANTIC CATTLE TRADE AND ITS REGULATIONS FROM A VETERINARY POINT OF VIEW.*

BY WILLIAMSON BRYDEN, V. S.

Within the last year the American Export Cattle Trade has been before the public more conspicuously than at any time since its commencement, some fifteen years ago.

This has arisen principally from recent legislative and other interference at home and abroad, with a subject, imperfectly understood, not fully developed, and that has been grossly misrepresented. It is consequently regarded by those engaged in important branches of the business as in many ways unfair to them, and an injustice which cannot possibly benefit the animals, or improve materially their freedom from hardships in transportation. It is a blow, especially, at the ships, no matter what their class is or what ports they sail from, up a river, 130 miles or within an hour of the open sea.

This traffic, as is well known, suddenly assumed large proportions. At first both lean and fat cattle were shipped, until fear of contagious diseases stopped this and permitted only fat animals, fit for slaughter, in quarantine, on landing, and dressed beef.

At first, as with all new undertakings, a period of immaturity had to be passed. Ships built for other kinds of cargoes had to be converted into cattle boats, which was in most cases easily done. These were of different classes and tonnage. The crews may have been at first unused to ships with such cargoes and ventilation on some not as perfect as now. The cattle men were unused to the sea, many of them entirely unfit and often ill paid, so losses occasionally resulted, that could possibly have been avoided.

During the same period our Inland transportation systems were also imperfect and unprepared for the increased business, the stock yards and resting places poor and inadequate, the cars plain and primitive, many of them old, often overloaded and without sufficient experienced attendants. The animals were consequently neglected. Some died on the journey before reaching the yards, from which the survivors had often to be hurried to the ship without proper rest; bruised, tired, hungry and

* Read before the United States Veterinary Medical Association, Sept. 16th, 1891.

thirsty, it is no wonder that some died at sea, and directed every one's attention to the ships, unjustly blaming them as the cause of all these losses.

In spite of all this the business continued to grow, losses not being generally excessive, and insurance rates declined as those engaged in handling the cattle gained experience.

The British stock raisers could not supply their commercial, manufacturing, and working populations with sufficient home raised beef and mutton products, which they must have, at the lowest prices ; and which this and other countries had enough of and to spare, so the business increased and flourished, untrammelled by regulations or restrictions. Its rapid increase, however, made it necessary for the Privy Council of Great Britain to take some action in the matter to satisfy conflicting political, commercial and agricultural interests. For example :—Land owners, to whom the farms belonged, and the tenants who leased them for long periods at high rents, became alarmed at the great and sudden invasion, fearing that it might prove to their disadvantage and perhaps their ruin, even if the experiment was finally successful. Some politicians used the subjects for party ends. Others believed in Protection, or in fair play between nations. While others again believed that the British Colonies ought to get all the benefit of supplying her wants. The friends of Ireland, too saw in such an influx, especially of lean cattle, a menace to their regular business in supplying English and Scotch farmers, who raise large crops of roots, fodder, etc., with young, lean animals for fattening. Consequently all such influences had to be considered, all such interests had to be dealt with.

When to these were added the fear of contagious diseases, from which the agriculturalists and stock raisers of Great Britain have suffered so much within the last 40 or 50 years, the objections and fears of the farmers, especially, were to be expected.

The discovery soon after this trade opened that Contagious Pleuro-pneumonia was wide spread in some districts of the Eastern States, and its subsequent appearance in the West, the extravagant reports of the prevalence of Tuberculosis made by United States and State officials, the alarming and sensational methods adopted by them to eradicate it, as witnessed in Maine and other parts of the Eastern States, where instead of individuals being condemned, not only whole herds were slaughtered, but animals sold long before, if some relationship could be traced, were hunted up all over the country and dealt with in the same summary

manner. The fact of dealing with such a disease more harshly than they would with Contagious Pleuro-pneumonia, surprised every careful student of the subject and led many to think that our cattle population was in a deplorable condition. At all events, it forced many people abroad to suspect that what was being called Tuberculosis was really a dangerous extension of Contagious Pleuro-pneumonia, and yet this did not exhaust the list of obstacles for still other diseases such as splenic fever, anthrax, actinomycosis, etc., annually during what ought to have been the best months of the year for shipping cattle, demanded their sacrifices.

When all this is considered, the moderately conservative course pursued by the Privy Council of Great Britain would surely seem deserving of applause, although at the same time it makes one wonder what their course will be when the United States is declared free from contagious diseases, which the Bureau of Animal Industry assures us they will be soon able to do, and which we all hope will be the case.

The opportunity is certainly a grand one for them to show practical statesmanship of a high order, and which will remedy in part at least the unfortunate state of things, which took the meat supply out of the hands of the native farmers and stock raisers where it *naturally* belongs. As occurred when fat cattle and dressed beef only, dared be admitted. Surely there can be no great danger in admitting healthy, young "store," as young animals for fattening are called, the farmers would again be "in" the business, and so would British railroads and smaller ships.

Suppose a Country well stocked with two year olds, born and bred in a natural way on the prairies and plains, from improved herds, suckled by their mothers—not on skim milk or slops—should not such animals increase greatly in size and ought to pay well for feeding. They are raised under circumstances, that makes them not only hardy, but that fits them for any kind of a journey. The danger from such to the farm stock of a Country must be trifling indeed. Another important thing to be considered is the liability to sudden interference with supplies from long distances in the event of war, fat cattle and beef would be exhausted in a week, whereas a Country full of young "stores" would last a year—besides improving and fertilizing the farms so that thus crops would double.

It must be the veterinarian's, as it is the scientific solution of the whole business if politic and questionable measures do not

interfere. It also offers a solution to the humane side of the question, if carried on under proper restrictions and regulations, applied, not to the ships alone, but to the whole journey whether on land or sea. For if old ships are condemned, why not old cars, cattle yards, etc. ? applied, not to mean unscrupulous ship owners, but to a reckless, unscrupulous class of shippers and foolish Legislators who have caused by far the most trouble.

The great fault with "good" friends like Mr. Plimsoll, earnest well-meaning people no doubt, is, that their methods of investigating the subject have given them false impressions of the share of blame the ships are liable for. Of course, there are good ships and poor ones, good ship owners and mean ones. He has done the regular lines great wrong and injustice. For the fact is that reckless shippers have been largely to blame for the hardships the animals have suffered, being subject to no regulations in handling their cattle, for none worthy of the name have ever been carried out on the Inland half of the journey, and more than half of the help sent to sea with their cattle has been ill paid and worthless.

The movement of large bodies of cattle has always been attended with some degree of hardship from the times when they had to be driven from Market to Market to the present, and half of the lives of most of such animals is made up of hardship ; this must not be lost sight of. Those sheltered and cared for—in warm places—while being fattened cannot endure the fatigue and exposure that animals can that have grown hardy and strong on their native plains under scorching heat and droughts of Summer and the storms of Winter. The *class* of animals that ought to be allowed to be shipped is therefore the most important consideration in determining what regulations are necessary ; the alterations required for the ships being entirely a secondary matter, and something that can easily be settled after.

Soon after the commencement of this traffic and up to a year ago great improvements were made in the cattle cars which led every one to believe that the animals would be greatly benefited ; whether this was due to the energy of the patentees and the Companies controlling them, the enterprise of the railroads, the demands of the shippers, or all combined, I cannot say, at any rate "hope told a flattering tale" for a greater average of comfort to the poor beasts was at least made possible, and if proper regulations should be enforced upon unscrupulous shippers and slack practices, much benefit would follow. But as the greater

efficiency of these cars with their conveniences for feeding and watering, improvements in brakes and couplings and other attachments, and contrivances which doubled the rate of speed at which such trains were formerly run, became demonstrated, the example of the willing horse that just gets more to do, repeated itself. For instead of the proper complement of animals being carried, and resting places stopped at, it is now no unusual thing to find two or three extra ones crowded into the car load and hurried through without any attention. Thus, the animals do not receive the benefit of such improvements, as all the abuses incident to the old cars have been repeated. Of course there are shippers who handle only the finest cattle and take proper care of them as well as of any class of animals shipped by them. They are not all reckless. The promised improvements in the stock yards and resting places at our Ports have not been carried out; they ought to belong to the Government, but must not be located as was blunderingly done in the case of the Boston Cattle quarantine which is a disgrace to the Department. Many of the yards remain the same as at the commencement; one port at least, Portland, has none. At different times during the Spring months, when the frost is leaving the ground and the weather is rainy, it is no unusual thing to find the cattle standing up to their knees—yes to their bellies in mud, the poor creatures being unable to drag themselves through it to lie down; or to reach water and feed, the yards being often in this condition for two or three weeks at a time. Then again in Summer, they are exposed to the burning sun without shelter, their tongues hanging from their mouths, and they panting as though the breath would leave their bodies. To animals that have been fattening in idleness under cover for months, this is a very poor preparation either for the rest of the journey, or the rest such a journey demands, without even counting their sufferings in open sided cars in the storms of Winter.

Nothing could better illustrate the point that it is useless to put high standard restrictions on the ships before the inland systems are on a level with them, than the fact that some of the finest ships ever constructed for the business have within the last six months lost as many cattle as were lost on the smaller ones, which they replaced, during the same length of time. I allude to the Leyland Line. This was from no fault of the new ships. The shippers sent a class of animals unfit for shipment, when forced to undergo hardships from reckless treatment and abuse

before reaching the dock, a fact which the United States officials are perfectly cognizant of, and still overlook.

Mr. Leyland, who owns one of the finest Lines that ever crossed the Atlantic, said at the recent investigation in London :—"it is not a question of stopping the trade, but of regulating it,"—or words to that effect, and it is the key to the whole subject, to look out for reckless ship owners and shippers and slack practices every where.

As is, well understood, this matter must be regulated, but the ships must not be made the only sufferers. Neither for that matter must the Inland systems, or any other. There is no need for any regulations that will either destroy or embarrass the trade, or that cannot be easily arranged and enforced. Every branch of the business must be in harmony with the other, and the great nations engaged in it must be just to each other, and see to it that all regulations and restrictions are framed and impartially carried out; not through the tricks and bounce and bluff that scheming traders resort to, but as would be expected between two great honorable nations. No order even from the highest sources must be allowed to pass diseased animals when justly and wisely condemned, as was recently done in Boston with scale sheep.

In some respects the recent investigation in London may result in good in the future, in others it has already done great harm, and in one instance its effect has even been *unpatriotic*, as when the United States is encouraged to deal with British ships in the harsh arbitrary way they are doing. For proof of this, I will take the liberty to quote from a letter to me from the department at Washington, when appealing to them for a delay of the 2 feet 8 inches clause in the cases of Lancastrian and Philadelphian which says of the regulations that they "meet the objections raised by English authorities, and will most probably prevent their issuing such stringent measures as might have driven all vessels out of the transatlantic cattle trade." What nonsense! A party that would encourage such a thing would not last a year in Great Britain.

These regulations have consequently been carried to such a high standard that ships built expressly for this trade by the highest authorities in marine architecture do not reach it. Not only this, but the enforcement of the restrictions imposed are being carried out so long before the regulations affecting the Inland systems of transportation, etc., can be carried out, that it is a

piece of patchwork and not creditable to the fairness that ought to govern such transactions between nations. The improvement of the stock yards, by building shelters and drainage, the class of animals fit for shipment, their size and weight, the number allowed in a car, etc., these things must have been wilfully lost sight of altogether. The number that die on the Inland journey to Port is not known, and post mortems are seldom or never made, disinfection is hardly thought of *excepting on the ships*, all this part being a "go as you please."

This solicitude for the condition of British ships is unbounded, even to the extent of inconsistency. Heavier fittings are demanded, although their fastening to the deck is the same, stantions are substituted by heavier ones, although they could have been strengthened with wood, which has always proved sufficient and only makes extra expense; spaces are widened, instead of regulating the size and weight of the cattle, if 2 feet 6 inches is enough on the spar deck it must be enough on the main deck; valuable space is sacrificed for alley ways, instead of employing an extra man or two, not "stiffs," but men paid for this work, which only keeps them busy about ten days in a month, the other twenty days of their engagement being spent in idleness. All this power is in the hands of the Department, yet they have not used it. The bill conferring this power passed without Boston's members of Congress knowing that their port, the finest in the world, was being classed with Philadelphia 130 miles up a river, their steamship agents too simply bowed their heads and accepted the situation, poor creatures.

No finer opportunity was ever offered the veterinarians of any Department to distinguish themselves by a splendid philosophic interpretation of this vast subject, no worse failure to grasp the situation with professional comprehensiveness and justice could well be presented; the assumption of the role of shipwrights and marine architects by them and the neglect of proper professional work is a subject they must expect to be criticized for. Were the case reversed, and United States ships subjected to such treatment by a foreign country under similar circumstances, I am very sure it would not escape Mr. Blaine's attention, or be allowed, without a vigorous protest and demand for impartial treatment; every concession demanded from his ships having to be met by equal improvements on the first stages of the journey; well might another committee be appointed to investigate this end of the business.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The Twenty-eighth Annual Meeting of the United States Veterinary Medical Association was held at Willard's Hall, Washington, D. C., on September 15th and 16th, 1891.

FIRST DAY'S PROCEEDINGS.

The meeting was called to order by the President, Dr. Huidekoper, at half past ten o'clock, A. M. On roll call by the Secretary, the following were present: Drs. Barron, Berns, Bryden, Clement, Dougherty, Faust, Faville, Hinkley, Hitchcock, Hoskins, Huidekoper, Kuhne, Kilborne, Kidd, Lyford, Lowe, Martinet, Michener, Miller, R. A. McLean, Peters, T. B. Rayner, Jas. B. Rayner, Jas. L. Robertson, Swedberg, Thompson, Turner, Walmer, Wende, Weber, Winchester, W. L. Williams.

Others of the profession were present at the opening. Drs. Jno. W. Gadsden, Wm. B. Wertz, N. Rectenwald, Isaiah Michener, J. C. Walker, H. B. Rayner of Pennsylvania, Dr. J. C. Foelker, delegate from the Pennsylvania State Veterinary Medical Association, Dr. H. A. Meisner, Maryland, and Dr. G. A. Jaman, District of Columbia, Drs. C. B. Robinson, J. D. Robinson, and J. E. Parsons, New Jersey, Drs. A. M. Farrington, Wm. Runge, I. N. Krowl, Dr. J. C. Dustan, delegate from the Veterinary Medical Association of New Jersey, Dr. Wm. Somerville, New York, Dr. W. H. Scruby, Minnesota, Dr. H. S. Hogsett, Virginia, Dr. M. E. Knowles, Indiana.

The President addressed the Association as follows:

Gentlemen:

This association has nearly completed the fourth decade of its existence, and within the last decade, we have held meetings, when we looked rather anxiously to know if there would be a working quorum of members present, and regretted that, having come a greater or less distance, that there was not more to be done than the alteration of some of the by-laws, the resurrection of some oft-time discussed question on pleuro-pneumonia, and the eating of a dinner. Within the last few years no such problems have been obtrusive; we have gained in the number of our members and in the zeal with which they attend; since the adoption of the new constitution—their last revision—the constitution and by-laws have been let alone and we trust that they will be unaltered for a long time to come; other

diseases than lung-plague in cattle have demanded the attention and legislation of the country, and reports and papers have been of sufficient volume and merit to fully occupy our time.

Last year for the second time we varied the itinerary of the association's cycles and left the New England and Middle States, to go West for which we were well rewarded; the older members were shown how large and how active the profession had grown in the vast agricultural districts of the Mississippi, and the veterinarians of that region learned that there existed a United States Veterinary Medical Association, founded, organized and managed for the interest of the profession at large and destined to become in reality as well as in name the representative body of the whole country.

The success of the meeting held last year at Chicago, seemed to demonstrate conclusively that the change from two semi-annual meetings of a day each, to one annual meeting lasting over two or more days had been a fortunate one, but the test and proof of this must lie with the members themselves in the interest which they show in attendance, and attention to the matters which are brought before the Association. The Association has assumed a size and standing now which makes the success of its meetings not only of consequence to the personal comfort and satisfaction of those attending, but the larger meetings and the character of the subjects which are brought before them, have become of public interest and the results of our meetings are reflected over the community, who will judge us and our merits and worth, by the opinion which we ourselves form of each other.

There are doubtless here many members for no fixed or definite reason beyond the good fellowship, and social enjoyment which they know they will find, and we all find here one of the relaxations and pleasures of life, but to insure this for the future imposes a serious duty upon us in regard to the election of members and the retention of those whose actions and methods are detrimental to the profession. We are all apt to be too good-natured in overlooking injurious things which do not seem to affect us individually. It is incumbent upon every member to scan and search the list of applications for membership as critically as he would the records of his own personal associates, and if there exists any proper cause why a man should not become a member, the reasons for it should be placed before the Association. Putting to one side all personal feeling and prejudices, let every man vote for or against the candidates according to their merits as reputable and honest Veterinarians.

I wish to urge upon you the importance of organizing and conducting local, county and state Veterinary Associations, upon principals in harmony with the United States Veterinary Medical Association, and I would like to see it become a requisite condition to qualify a man to become a member of this Association, that he should be a member in good standing of his county and state Association. It should be that when we are asked by anyone, what Veterinarian we recommend in a distant locality that we can answer "any member of the United States Association you will find a reputable practitioner."

But, I am occupying too much of your time, and I will leave it for you to learn for yourselves, how faithfully most of your officers and those to

whom you have intrusted the affairs of the Association during the last year have performed their duties.

The Comitia Minora will recommend to you various matters which have been duly weighed and considered by them as for the best interests of the Association.

The Chairmen of their respective committees will report in full the results of their year's labors.

The Secretary, Dr. Hoskins, will make you a report of his work, which I can assure you from personal knowledge has been most arduous and which deserves the most grateful recognition on our part, as to his labors, the greater part of the present enthusiasm of our members is due.

From the reports of the Assistant Secretaries, you will see that they have been unusually active in their work.

Among the papers to be presented, we have that on Barren Mares, by Dr. Lyford; on Rachitis, by Dr. Williams; and others of interest to the practitioner, while in the Report of the committee on Food Inspection, Dr. Bryden's paper on "Foreign Cattle Transportation and its Regulations," and in the discussion of Prof. Liautard's paper on Veterinary Jurisprudence, postponed from last year, we have subjects of national importance, which affect our agricultural products, our health, and our commerce in animals, both at home and abroad.

I beg to thank you, gentlemen, most sincerely for the honor which you conferred on me, by selecting me president of this association for the last year, and as your representative for the moment, for you, I thank the Local Committee of Arrangements, Drs. Walmer, Kilborne, Swedburg, Dougherty, Faville, Clement, and Martinet for their labors which have placed us in such favorable surroundings for a successful meeting which I am sure this will be.

The Secretary read the minutes of the last meeting. Dr. Williams remarked a discrepancy in the minutes, in regard to the membership of the Special Committee on Food Inspection; the name of Dr. Clement had been left off, whilst the name of Dr. Atkinson had remained. The president said that through an inadvertance Dr. Clement's name had been overlooked. Dr. Atkinson was at first named as a member of the committee, and afterwards his name was erased and that of Dr. Clement substituted. The correction was ordered made. The minutes were then received, and, as corrected, approved.

The President called the next order of business, the report of the Comitia Minora, which the Secretary read as follows:

A special meeting of the Comitia Minora held at Willard's Hotel, Monday evening, Sept. 14th, '91, 9. 30 P. M. In the absence of the Chairman, Dr. W. J. Coates, President Huidekoper presided.

The following members were present: Drs. Huidekoper,

Williams, Hoskins, Winchester, R. A. McLean, T. B. Rayner, Lyford and Dougherty.

Absent : Drs. Roberson, Coates and Butler.

The minutes of the last meeting of the Comitia Minora at Chicago were read and approved.

On motion it was moved and adopted that we dispense with the reading of the minutes of the last regular meeting of the Association.

The minutes of the special meeting of the Comitia Minora were read and approved.

The list of applicants for membership then came under discussion ; the first considered were the names for Honorary Membership, and after a thorough examination of the names of Drs. Theobald Smith and Prof. Jas. Law, it was deemed best by unanimous vote, that we do unfavorably recommend.

It was urged that our regular membership being open to gladly receive worthy members of the veterinary and medical profession, that we would heartily consider with favor such names for active membership.

The list for application to regular membership was then considered and the following names were favorably recommended :

Dr. J. T. Ryan, W. H. McKenney, J. T. Donnelly, E. D. Roberts, F. Brenton, J. C. Whitney, W. D. Daniels, E. P. Niles, W. B. Niles, Jno. J. Millar, M. H. Reynolds, John A. Kenny, W. S. Mayo, H. A. Meisner, T. C. McNeil, R. W. Story, M. E. Knowles, J. B. Turner, E. J. Nesbitt, Jos. G. Hill, W. H. Bernmeyer, H. H. Dews, Jas. B. Paige, E. B. Ackerman, W. L. Labaw.

The names of Drs. A. M. Bigelow, W. E. Peterson, Edward P. McKenna, being improperly vouched for, were favorably endorsed, after being vouched for by Dr. J. T. Winchester.

The application of Dr. D. A. Cormack was withdrawn.

The name of Dr. Henry A. White was unfavorably considered, as well as those of Dr. W. T. McCoun, Dr. John Airth.

The name of Dr. G. W. Palmer was not entertained, owing to the filing of an apparent false statement.

The name of Dr. Jno. A. Bell was laid over owing to his application lacking a proper voucher.

For non-payment of initiation fees and dues we recommend that the following names be dropped from the rolls :

Drs. E. M. Berkley, J. E. Gardner, (Albert Hassall), reconsidered. J. S. Culbert, G. Grimshaw, T. C. Herbert, A. Jasma, with instructions to the Secretary that he be directed to remove

from his letter-head the claim to membership in this Association. H. C. Klicker, J. Monica, M. O'Connell, G. P. Penninan, Fred. Lamberton, T. E. Maloney, B. G. Orlopp, C. H. Peabody, J. T. Page, W. B. Rowland, S. L. Richards, J. W. Sallade, H. Whitney, Wm. T. Walsh, W. H. Appel, Hara Taka Yokura, E. W. Roche, E. W. Rowland, Geo. H. Roberts, R. L. Tucker, J. P. Wilson, Chas. J. Weidner, Fred. Winant, A. C. Young.

It was recommended that the dues of Dr. J. Penninan be remitted to date.

Information being filed of a violation of the Code of Ethics by Dr. Jno. T. Claris, the Secretary on motion was instructed to request him to make explanation of the same.

It was moved and seconded that we change the wording of the application blank, as follows, strike out "References" and insert "Vouchers for."

On motion it was moved and adopted that we adjourn until 9 A. M. of the 15th.

W. HORACE HOSKINS, *Secretary.*

On motion the report was received.

Dr. Peters. Before accepting that report, do we understand that the Comitia Minora report unfavorably on the honorary membership of Dr. Smith and Dr. Law? I think some explanation is due the Association for such act.

The President. That question comes up for action later. You now have before you for your action the first recommendation of the Comitia Minora, which is, that the meeting of 1893, in Chicago, be an International one; that a committee of three be appointed to arrange for it and report upon the same at the next meeting.

Dr. Clement. I move that the recommendation of the committee on that subject be accepted. It is very proper that the meeting of 1893 should be held in Chicago, and should be an international meeting. I have not given the subject much thought, but that is my impression just now. Dr. Berns seconded the motion. The question was put, and the motion was agreed to.

The President. The next recommendation is in reference to the application blank. Dr. Faust moved that the Association authorize the use of these blanks, which have been adopted by the Comitia Minora. The motion was seconded, the question put and agreed to.

The President. The third recommendation of the Comitia Minora is in reference to the action of the Committee on the applications of Drs. Smith and Law for honorary membership.

Dr. Clement. It seems to me that we should be rather guarded in this matter. As far as Dr. Smith is concerned (I do not know anything about Dr. Law, never having seen him), he is perfectly willing and anxious to come into this Association as an active member, but so long as his name has been proposed as an honorary member it may be embarrassing, and perhaps not the proper thing to do to turn him down. I think he should feel probably as some of us felt in regard to the medical association; that his presence was not wanted and he would be rather out of place here. So far as he is personally concerned, he has done considerable for the profession, either directly or indirectly, as you chose to put it, in his special line. Whether we agree with his conclusions or not in all cases, the fact remains that he has done considerable work. I think we had better consider this thing fully before turning down a name like that. It would make it rather embarrassing in the future in proposing members. Perhaps some of us would have the names of men we should like to propose, and certainly we should not like to have them refused membership.

Dr. Winchester. That calls for an explanation. I speak for myself, and others may do as they like. Dr. Smith is a young man, and there is nothing in our Constitution and By-Laws against his becoming an active member of this association. If he desires to become one, he can go through the regular course, as the rest of us have done, and undoubtedly his application would be favorably received. But to make an honorary member of any one who sees fit to ask that honor I think would be throwing the honor away as a society.

Dr. R. A. McLean. There is this further to be said in the line of Dr. Winchester's remarks: I assure you that the Comitia Minora gave thorough examination to Dr. Smith's case, and I have no doubt his name will be considered favorably if it comes through the regular form. We all had to work for our present standing. If an honorary membership in this association were a gratuitous affair it would be an empty honor. We have had men who have worked for thirty years and who have grown gray-headed in the service, who could well be retired and promoted to honorary membership. Let us consider this an honorary degree

as the H. F. R. C. V. S. is in the Old Country. Dr. Peters agreed with Dr. Winchester and Dr. McLean on the subject.

The Secretary. The question of honorary membership should be one which individual members should consider very thoroughly before they submit the name. We should submit a name certainly that every one is familiar with, and it should be a person from whom every member of our Association had received marked benefit, and he should be a man so situated in life as in some way to be unfit for active membership. We should not consult our personal wishes and desires in such matter to confer upon some personal friend or warm admirer an honorary membership in this Association. That has seemed to be the tendency in several directions which have already come to the notice of the Secretary.

Dr. Clement. I quite agree with the spirit of the remarks made by Dr. Winchester and Dr. Peters and Dr. McLean and Secretary Hoskins, and I shall lay emphasis on what the Secretary has just said. But the point I wish to make in particular is that members should be very careful in proposing people for honorary membership in this association unless they have some particular reasons, and no member should propose the name of one, unless he knows all about it. I feel pretty certain that Dr. Smith did not know his name was to be proposed for honorary membership. Honorary membership in this Association should be regarded as of high order to be conferred upon those who have done, or are capable of doing great service for the association and the profession in general. I would suggest that Dr. Smith be informed that the Association would be very glad (although I do not know whether that would be in accordance with the Constitution) to have him as an active member.

Dr. McLean. I move that the report of the Comitia Minora in regard to the application of Dr. Smith be adopted. The motion was seconded, the question was put, and the motion was agreed to.

The President. The next name to be acted upon is that of Dr. James Law.

The Secretary. The Committee unfavorably recommended him on the ground that Prof. Law is not too young a member to be identified with this association, as he is in active participation in the work of the New York State Association, but because of the fact that he had been a member of this Association at a critical

time in its history and saw fit to withdraw and shirk his part of the responsibility in sustaining the Association before the country. On that ground it was recommended that his name be unfavorably recommended.

Dr. Clement. I move that the report of the Committee be adopted. The motion was seconded, the question put, and the motion was agreed to.

The President. The next recommendation is in reference to the list of applicants favorably reported by the Comitia Minora.

Dr. McLean. I think that instead of going all over these names that it would be well for the Secretary to cast the ballot of the Association. The President. It is proper that the names be read.

Dr. McLean. I move that the Secretary cast the ballot of the Association for the applicants for membership recommended favorably by the Comitia Minora.

The motion was seconded, the question put, and the motion agreed to, and the Secretary announced that he had cast the ballot of the Association in favor of the following :

- J. F. Ryan, V. S. *Montreal*, Chicago, Ill. W. L. Williams, voucher.
- W. H. McKinney, D. V. S., *Chicago*, Genesee, Ill. M. R. Trumbower, vchr.
- J. T. Donnelly, V. S., *N. Y. Coll.*, Astoria, L., I., N. Y. R. A. McLean, v.
- E. D. Roberts, D. V. S., *Chicago*, Jamesville, Wis. Jos. Hughes, voucher.
- F. Brenton, V. S., *Ontario*, Detroit, Mich. J. Hawkins, voucher.
- J. C. Whitney, V. S., *Ontario*, Hillsdale, Mich. J. Hawkins, voucher.
- W. D. Daniels, V. S., *Ontario*, Cardington, O. Wm. R. Howe, voucher.
- E. P. Niles, D. V. M., *Iowa Agr. Coll. Vet. Dept.*, Ames, Iowa, S. Stewart.
- W. B. Niles, D. V. M., *Iowa Agr. Coll. Vet. Dpt.*, Ames, Iowa. S. Stewart.
- Jno. J. Millar, V. S., *Ontario*, Sioux City, Iowa. J. T. Kennedy.
- M. H. Reynolds, M. D., D. V. M., *Vet. Dept. Iowa Agr. Coll., Iowa College of Physicians and Surgeons*, Keosauqua, Iowa, S. Stewart, voucher.
- Jno. A. Kenny, D. V. S., *Am. Vet. Coll.*, N. Y. City. T. Birdsall, voucher.
- W. S. Mayo, M. S., D. V. S., *Chicago*, Manhattan, Kan. Daniel Lemay, vr.
- H. A. Meisner, V. M. D., *Vet. Dept. U. of Pa.*, Baltimore, Md. R. S. Huidekoper, Wm. Dougherty, vouchers.
- Jas. C. McNeil, M. D., *Vet. Dept., U of Pa.*, Pittsburg, Pa., J. A. Waugh, voucher.
- R. W. Story, V. S., *Ontario*, Princeton, Ill. Dr. Hollingsworth, W. L. Williams, vouchers.
- M. E. Knowles, D. V. S., *Am. Vet. Coll.*, Terre Haute, Ind. W. Horace Hoskins, voucher.
- J. P. Turner, V. M. D., *Vet. Dept. U. of Pa.*, Fort Niobrara, Neb. W. L. Zuill, voucher.

- Alfred M. Bigelow, *Harvard V. D.* Norwood, Mass. J. B. Winchester, voucher.
- Edward J. Nesbitt, *Am. Vet. Coll.*, Poughkeepsie, N. Y. A. Liautard, W. J. Coates, vouchers.
- W. E. Peterson, *Harvard V. D.*, Methuen; Mass., F. J. Winchester, voucher.
- Joseph G. Hill, *Ontario*, Sennett, N. Y. Nelson P. Hinkley, W. G. Hollingsworth, vouchers.
- Edward P. McKenna, *Harvard V. D.*, Woburn, Mass. J. F. Winchester, voucher.
- Wm. H. Berkmeier, *Am. Vet. Coll.*, New York City. E. A. Parsons, T. Birdsall, vouchers.
- Henry H. Dews, *Am. Vet. Coll.*, New Bedford, Mass., W. H. Brownell, voucher.
- Jas. B. Paige, *Montreal*, Amherst, Mass. F. H. Osgood, voucher.
- V. L. La Baw, *Am. Vet. Coll.*, Springfield, Mass. A. Liautard, W. J. Coates, vouchers.
- E. B. Ackerman, *Am. Vet. Coll.*, New York City. A. Liautard, W. J. Coates, vouchers.

Dr. Faville. I move that the Secretary be instructed to cast the ballot of this Association for Drs. A. M. Bigelow, W. E. Peterson and Edward P. McKenna, who being improperly vouched for were favorably endorsed, after being vouched for by Dr. Winchester.

The motion was seconded, the question put, and the motion was agreed to.

The Secretary cast the ballot as instructed.

The President. The next clause of the report is the withdrawal of the application of Dr. D. A. Cormack, followed by the recommendation of the committee of unfavorably considered applications of Dr. H. H. A. White, Dr. W. T. McCoun, and Dr. John Airth. On motion the report of the Committee was adopted.

The Secretary read from the report of the Comitia Minora as follows: "The name of Dr. G. W. Palmer was not entertained, owing to the filing of an apparent false statement." On motion of Dr. McLean the action of the Committee was sustained. The name of Dr. John A. Bell was laid over by the Comitia Minora owing to his application lacking a proper voucher. If anybody here would like to vouch for Dr. Bell I would like to have him ready for next year.

For non-payment of initiation fees and dues we have dropped a number of names, They have been given far beyond the time

allowed by your By-Laws and Constitution to pay their dues to the Association. I sent to some of these parties nine or ten bills with no apparent effect whatever, and the Comitia Minora recommend that their names be dropped from the rolls. They are Drs. E. M. Beckley, J. S. Culbert, J. E. Gardner, G. Grimshaw, F. C. Herbert and A. Jasme, whom the Comitia Minora instructed the Secretary to direct to remove from his letter-head the claim to membership in this Association; also H. C. Klicker, Fred. Lamberton, J. Morice, T. E. Maloney, M. O. Connell, B. G. Orlopp, G. T. Penniman, C. H. Peabody, G. G. Pearson, I. F. Page, E. W. Roche, W. B. Rowland, E. W. Rowland, S. L. Richards, George H. Roberts, J. W. Sallade, R. L. Tucker, H. Whitney, J. P. Wilson, Wm. F. Walsh, Charles G. Weidner, W. W. Appel, Fred. Winant, Hara Taka, Yokura, and A. C. Young.

Dr. McLean. I move that the recommendation of the Comitia Minora be adopted. The motion was seconded, the question put, and the motion was agreed to.

The Secretary. It was recommended that the dues of Dr. J. Penniman be remitted to date. He was one of the organizers of the association, and advanced in years, and is so situated that he cannot attend our meetings. Dr. Faville moved that the recommendation be adopted. The motion was seconded, the question put, and the motion agreed to.

The Secretary. The Comitia Minora recommended that the salary of the Secretary be increased to \$200. I recommended before the Committee this raise in salary. Being one familiar with the arduous character of this position I thought no one was in a better position to urge the matter. I had determined not to allow my name to come before you for re-election. In the last year I have sent out between four and five thousand communications of different kinds and I sent out nine hundred and fifty notices of this meeting in the last six weeks. The work of this Association has kept me out of bed until one and two in the morning. I retired at one o'clock last night and go up at five o'clock this morning in order to put the work in shape for this meeting. It is necessary for me to attend all meetings, and last year I used up my salary and fifty dollars besides in attending meetings. I think as a stimulus to your incoming Secretary that you should raise the salary to \$200. The dues and income of the Association reach anywhere from \$750 or \$800 a year, and probably the

expenses of such a Secretary as I have been will not reach more than \$400 or \$500, and I think it is your duty if you expect the work of this Association to be carried out not as it has been done, but as it should be done, your new Secretary will well earn his \$200. *Dr. Faville.* I move to increase the recommendation of the Committee to \$250, and if I am in order I will also move that our present Secretary be given a life secretaryship in the Association as well as \$250 permanent salary. (Laughter and applause.) *The President.* This increase has been based upon a careful calculation of income and expenses so that it might be perfectly warrantable within the limits of the resources of the Association. *Dr. Faville.* It seems to me that the increased membership of this Association, and our increased income, with the increased labor which the Secretary of necessity must have placed upon him, and all that sort of thing, that \$250 is little enough for us to pay. According to our Secretary if his successor is as economical as he has been we will have two or three hundred dollars over our expenses. With the increased salary that the Comitia Minora has recommended there will be left a balance of \$200 or \$300 in our hands, and I do not think a portion of that money can be better spent than for compensating our Secretary for his arduous labors. I move that the recommendation of \$200 be increased to \$250.

Dr. Williams. I propose that we give a stated salary with his necessary expenses. We hold our meetings now at widening diverted points. Mr. Hoskins had to go to Chicago last year at considerable expense. We do not know who is to be the next Secretary or where the next meeting is to be held, and it occurs to me the better way to arrange this is to allow the Secretary his necessary traveling expenses and then allow him a salary besides—something which he could regard as a salary. According to Secretary's statement his salary has proved a deficit. He has more than expended his salary in attending the meetings.

The Secretary. I visited Washington without any instructions from you to look over the work of the local committee here to see that our room was fit for the meeting and that the hotel reception would be such as we should have. I looked after the points upon which we have heretofore been tripped up. I also visited the New York Association thinking we might draw some of their members and interest them in the National Association. Those things were not necessary for a Secretary to do, but my

interest in the matter was such as to do it and I did it at some expense.

Dr. McLean. I move that the recommendation of the Comitia Minora be adopted. The Committee went into this quite thoroughly, and until we find out exactly how well our new members are going to stick to us and pay their dues, we feel that \$200 is about as much as we could give, although it does not compensate the Secretary for his labor. I would like to add to the report that the Secretary be allowed to draw from the treasury the sum of \$50 for expenses incurred by him during the past year, that would leave the salary at \$200 and recoup the Secretary for his extra outlay last year.

The Secretary. I had recommended this increased salary solely that you might give your future Secretary the necessary stimulus in the matter. Any additional expense paid out by me has been gladly paid. The success of the National Association has been a thing very dear to me for a great many years, and ever since I have been a member. I ask that the amendment in regard to the \$50 be withdrawn.

Dr. Miller. Nobody knows better than I of the arduous labors performed by our Secretary during the last year. He has spent many sleepless nights in doing the work of this Association. I know that and I also know that he paid out during the last year more than double the amount he received from this association. If he received to-day double the amount of his salary he would not be compensated for the money he laid out for this association. He says in the modesty of his nature that he did all this for the good of the association, and we take his word for it, but we do not think it proper or right that any man should be called upon to do that continuously while he continues as our Secretary, and I think the motion of Dr. McLean will prevail, and I hope the modesty of the Secretary will excuse him from opposing the move. *The President.* The motion of Dr. Faville, that the Secretary's salary be increased to \$250 is before the House. *Dr. Faville.* I withdraw the motion. *The President.* You have before you gentlemen an amendment to the recommendation of the Comitia Minora increasing the salary of \$200 to \$250. There is an amendment pending thereto authorizing the Secretary to draw upon the Treasury for \$50 additional towards defraying the expenses incurred by him during the past year. Do I understand this to apply to future Secretaries? (Cries of "No

No"). *Dr. Faville.* The idea is to adopt the recommendation of the Comitia Minora and to add thereto the authority to the Secretary to draw \$50 from the treasury to cover expenses already incurred. This does not apply to anything in the future, but to cover outlays in the past. *The President.* I think that comes under new business. You have now before you the motion as to the recommendation of the Comitia Minora in regard to the future salary of the Secretary. The question was put, and the recommendation of the Committee was adopted.

Dr. Hitchcock. I rise to a question of privilege touching the question that came up in the report of those members who had just been suspended for non-payment of dues. I find the name of E. M. Beckett. Also when our Secretary read the names of those suspended I think the first name was E. C. Beckett. I would like to know if he was suspended. *The Secretary.* Dr. E. C. Beckett was not considered. *Dr. Hitchcock.* I think Dr. Beckett will be here during this meeting, and if he is suspended for non-payment of dues it places him in an embarrassing position. I think if he comes here it will be with the intention of paying whatever he owes. *The Secretary.* E. C. Beckett was dropped at Chicago. He had in the neighborhood of eleven bills sent him to which he paid no attention, and was dropped at Chicago. *Dr. Faust.* We should consider when our Secretary has given repeated notices and they are not acknowledged that we are treated with contempt, and it is then high time to drop such members.

The President. The next order of business is the report of the Committee on Intelligence and Education.

Dr. Peters made the following report:

Report of the Chairman of Committee on Intelligence and Education of the U. S. V. M. A. for the year ending September, 1891.

Mr. President and Gentlemen:

As Chairman of your Committee on Intelligence and Education, I have the honor, for the second time, of submitting our Annual Report for your consideration.

Soon after receiving official notice that I had again been distinguished with the confidence of our President by being appointed to the chairmanship of this committee, for another year, I placed myself in communication with the other members of the committee, and after a due amount of correspondence with them, I have compiled the following statement of the results of our labors.

The conditions which obtained at the time of my last annual report, obtain to-day, and what I wrote regarding the status of our profession at that time, applies with equal force at the present. There is nothing in it which I wish had remained unsaid, although there is much which might have been said then that was omitted from lack of time, and for fear of making the material too ponderous to be interesting. It is my intention now to say a few words more upon the subject of education, and to conclude with a few words upon topics to which I think it would be well to call your attention.

So much has been said and written upon the matter of veterinary education in America, that I have no expectation of advancing any new or original ideas, but simply to reiterate and emphasize a few of those that have already been advanced, with the hope that this association will bring all its influence to bear in demanding progressive action and improvement in all the institutions of veterinary learning upon this continent, to which we have to look for future members of our organization.

If we look at the history of medicine in this country, and compare the history of veterinary medicine with it, I do not think that the outlook is so discouraging as many of our pessimistic writers would have us think it is.

It is not such a great many years since most, if not all, of the medical schools on this continent required but a two years' attendance, and when the matriculation requirements were much less stringent in them than at present. As the medical profession grew in influence and wealth the leading schools extended their course to three years, and made the requirements for admission higher, until to-day we hear that next year the Harvard Medical School, and the Medical Department of the University of Pennsylvania are to increase the regular course to four years, as their faculties have decided that three years is too short a period of study in which to acquire a sufficient knowledge of the science of medicine and surgery with which the young practitioner is to be turned loose upon an unsuspecting public. Heretofore American dental degrees have been the only ones in the field of medicine entitled to any consideration in Europe, and dentistry is the only branch of surgery which Europeans have come to this country to study, but this advance in two of our leading medical schools is a step towards securing more recognition for graduates of American medical colleges abroad, or for the graduates of these two schools at any rate, and it is not impossible, nay, it is even probable, that before many more years elapse there are certain branches of surgery and medicine that foreign physicians will find it to their advantage to come to this country to study. This seems to be particularly true when we consider the magnificent hospital and clinical advantages that are now offered in connection with the courses at the leading medical schools in many of our great cities.

It does not seem to me that it is very difficult for us to draw a parallel between the progress of medicine in this country and that of veterinary science; our profession being, perhaps, thirty or forty years behind her older sister. It is but a very few years ago that there were but two veterinary colleges in the United States, both in the city of New York, requiring attendance at but two short winter sessions, and having a

matriculation requirement that practically had no existence at all. With the addition of two Canadian schools there were but four for this great continent, only one of which required a three years' attendance, and was regularly a branch of a university; the other Canadian school being in all respects no better than those in New York. Since 1883 several other institutions of veterinary learning have been established, some like the old two years' schools, requiring no longer a course of study, and hailing all comers with open arms, no matter what their previous conditions, associations or educations may have been. Others connected with universities of different kinds established a three years' graded course, and made a pretence of having some sort of a matriculation examination. How well they have lived up to it those having inside sources of information can tell you much better than I. Then some of our agricultural colleges have established veterinary departments, and even go so far as to grant veterinary degrees.

This is the condition of affairs to-day. It certainly shows many changes within a few years. They do not appear to be for the worse. Let us hope then, that they are for the better.

The recognition of the veterinary profession by the University of Pennsylvania and Harvard University, certainly shows an interest on the part of these institutions of learning in this branch of medicine, even if the conception of the moving spirits in one of them at least, as to what veterinary science is, may be rather crude and visionary.

The course at these two schools, although having the advantage of being graded, greater length, and having a certain standard of admission, is counterbalanced in many ways by the cram course schools, provided the student entering the latter has sufficient perception and education to understand properly what is taught him, he is likely at the end of two years to know quite as much as the student at the other schools does at the end of three years, for the reasons that the faculties at many of the short-course schools have more veterinarians among them, and the student thus has the advantage of the training and ideas of a number of different men, instead of a very few, perhaps the few being the original veterinarian connected with the school with some of those who have graduated under his pupilage, thus leaving it but little better than a one-man institution. Furthermore, the clinical advantages at some of the shorter-course schools are very much better than at the longer-course ones, the hospital practice and out-patient departments being more extensive, the students in one often seeing more surgery, and more interesting cases in two short winters than those in the other would see in three long years. In one instance, at least, the great university establishing a veterinary department went so far as to ignore the existence of any veterinary profession at all in the city where it was established, and in order to get clinical material for its students, and make both ends meet (not having waited until it had any endowment fund) it did ridiculously cheap work to the detriment of existing practitioners, and such of its own graduates as settled near it.

Besides the veterinary schools pure and simple, we have to consider the veterinary departments of Agricultural Colleges, and perhaps I can best

do so by quoting from a letter of a member of this committee, Dr. Gerald E. Griffin :

" If the courses are too short, and the examinations easy, in the regular veterinary schools, surely to Heaven it must be a farce indeed to call a man a veterinarian who graduated from an agricultural school, where he is confined to the conservative ideas of one surgeon, who may not intellectually be far above the average, again I protest against the recognition of these schools by the association as veterinary institutes, and against the recognition of their graduates as veterinarians."

While I agree with Dr. Griffin to a certain extent, and think it would be much better if agricultural colleges did not grant veterinary degrees, at the same time they do grant them, and I do not see how we can very well help recognizing them. Their bearers are certainly educated men, they have a much better general education than most of our veterinary graduates, and in many ways it more than compensates for the greater amount of veterinary training that may be given a man who is so ignorant that he can barely write his own name. If the graduate of a veterinary department of an Agricultural College is not fitted for the duties of a practitioner, the great American public is smart enough to find it out, and his pocketbook is the main sufferer, unless, as is occasionally the case, he is an able enough political wire puller to hoist himself into a government office of some kind.

Having tried, in as few words as possible, to describe the condition of our veterinary schools, we have to consider the means for their improvement, and the matter has received quite as much attention from the pens of our veterinary writers as the standing of the schools themselves.

All manner of remedies are suggested, chief among which are endowments for veterinary colleges from the National Government, with governmental supervision, a uniform standard for admission, and a national examining board to examine applicants for membership in the profession. Or, if the central Government could not assume control of veterinary schools without illegally interfering with States' rights, it is proposed that States wherein veterinary schools exist pass laws of co-operation with the National Government to bring about the desired end.

I am one of those who believe that this country is too vast, the varying conditions of separate sections too different, and the requirements of the people of one locality so diverse from those of another, that it would not be policy for the central Government to dictate the management of the schools, besides being an undue interference with the rights of a people who have heretofore been supposed to have the power of thinking for themselves. In the past paternalism on the part of the general Government has not been advocated in this country, and the passage of a few more pension bills will be quite enough of a drain on the national treasury without any assistance from us, although I am well aware that when one lot of pigs are gathered around the trough it sets all the rest to squealing to get there too.

Nearly all of our institutions of learning have been well endowed by the munificence of wealthy people, generally by bequests received after the deaths of the generous individuals, and in this way all the better-known colleges and universities upon this continent have acquired their funds.

It should be our aim in the future to do our utmost to interest those who are fond of fine horses and cattle in the subject of veterinary education with the hope that in time a portion of those interested in the ownership or breeding of valuable live stock may make their donations to some of our veterinary schools, instead of endowing chairs of Greek or Ancient History in classical institutions, or making presents to theological seminaries, for the dissemination of knowledge that they never knew anything about, or took very little interest in during their lives. At present I am afraid that most of them take veterinary surgeons very much as they find them, without stopping to think who they have to thank for their existence, very ready to find fault with them for not knowing more, and never stopping to blame themselves for the veterinarian's lack of knowledge. Worse than that, many rich live stock owners seem to prefer the services of a quack to those of a man who has taken pains to acquire the best education that he can afford.

As to raising the standard of admission and graduation in the veterinary schools as they already exist, I think that is a responsibility that ought to rest chiefly in the hands of our association. It is an impossibility to have a uniform standard in all the schools in the United States, and even if we did, there would be plenty of room for diploma-mills across our northern border, and hordes of ignorant or lazy men ready to attend them, and return as soon as they could possibly obtain a bit of sheepskin, to become the most dangerous and unscrupulous quacks imaginable.

But it should be the feeling of our association that we advise a higher standard of veterinary training, that a man ought to present substantial evidence of a thorough preliminary education upon entering upon a course of veterinary study, and that we favor at least a three years' graded period of teaching.

If we show that these are our sentiments in no uncertain or timid manner, the faculties of those colleges who really have the interest and advancement of our profession at heart will speedily show a disposition to meet our requirements. Then we can decide what schools to recognize, and only allow graduates from them to enter our association. Schools that are run simply to advertise the officials connected therewith, or to act to their pecuniary advantage will continue to exist, and will continue to have students, but we should not recognize them in any way, and advise young men coming to us for counsel to have nothing to do with them.

At present it is of far greater importance that we advocate a higher standard for matriculation, than that we try to bring about any changes in the present courses of study in the various veterinary schools. Students upon entering should have a thorough English education in any event, and we should do all in our power to encourage graduates of classical and agricultural colleges to enter this profession. Given a young man with a good education, keen perceptions, a well trained mind and a desire to learn, and start him upon the right track, and he will acquire the knowledge he desires. If, on the other hand, he is unused to study, is ignorant, so ignorant that he can hardly read and write, much less take notes on lectures or comprehend the information which his instructor is striving to impart, he would never be a thoroughly educated veterinarian, even if he attended a ten years' course instead of two winter sessions of five months

each. In this latter class of men are those, to quote from my colleague, Dr. Griffin, "who complain that our veterinary journals are too scientific, and who admire the organ that gives them prescriptions and cure-alls in its columns."

First of all we must insist upon having *educated* men enter our veterinary schools, and it will be time enough when this is accomplished to criticise the curricula and length and number of sessions. It must be borne in mind also that to a certain extent at least "veterinary surgeons are like poets, born and not made."

In order to be really great as a veterinarian, a man must combine two rare gifts. First, he must have that peculiar mental organization which enables him to grasp and understand the art and science of medicine, so well exemplified in the late Dr. Austin Flint, which enabled him to stand at the head of the medical profession in this country during his life. Secondly, he must have that intuitive faculty of understanding animals, and gaining their confidence. A knack that applies to the horse more than to any other animal, and constitutes the difference between a horseman and one who is not. As the late William Herbert, better known as "Frank Forrester," says in his "Hints to Horse Keepers": "To become a perfect judge of a horse requires the observation and attention of half a life time; nor with every man will these be sufficient, for a certain degree of natural tact and talent, or adaptability to the study, is clearly indispensable; and there are some men who, if they were born in a manger, and brought up in a stable, would never become horsemen or judges of a horse."

Either of these great gifts to a degree approaching perfection, is very rare in any man. How much rarer, then, must be the two combined in a single individual?

"Frank Forrester's" words make as good an argument as could be advanced in a few sentences against the old-fashioned idea, that prevails more in England than with us, that the prospective veterinary student should serve a period of pupillage with a practitioner or farmer, in order to learn about animals and their management.

Our Secretary, Dr. Hoskins, in a recent article upon "Uniform Veterinary Education," after discussing various means for alleviating existing evils, suggests that it would strengthen our association, and give it more influence with the veterinary colleges, if legislation could be secured requiring that all candidates for veterinary positions in the army, and upon the Bureau of Animal Industry, and similar offices, be members of our association, it would also in a measure relieve the places from the "bane to-day of our infamous spoils system."

I will weary you no further with the matter of education, although one of my co-workers upon the committee advised that our report would be stronger if I devoted it entirely to this subject, as there are two or three other matters upon which I wish to say a few words.

First and foremost among them is the great medical sensation of the year, Koch's remedy for the treatment of tuberculosis, of which so much was expected, and from which only a great harvest of disappointed hopes was gathered. Even after it was found to be a failure as a remedy it still

retained great interest to us as veterinarians on account of its possible value as a diagnostic agent in determining doubtful or suspicious cases of tuberculosis among our bovine patients, but here again it proves to be a disappointment, as in some cases of tuberculosis the animal fails to react to the inoculation, and in other instances where the subject shows a marked reaction to the subcutaneous injection of the material, tuberculosis does not exist. A great drawback in arriving at its true value has been the anxiety on the part of many, if not nearly all, of the experimenters in whose hands it has been placed to obtain the results from its use predicted by Koch, rather than to observe its action in a cool, impartial manner, and accept the facts exactly as they are.

Koch's treatment of tuberculosis consisted in the inoculation of a sufferer from the disease with a ptomaine produced by cultivating the *bacillus of tuberculosis* artificially in a culture media, and is not an entirely original idea, Salmon and Smith of the United States Bureau of Animal Industry have successfully experimented with ptomaines from "hog cholera" cultures as a preventive inoculation for the disease. (See special report on "Hog Cholera" Bureau of Animal Industry, 1889). Professor Rudolph Emmerich has found that in various swine diseases, especially swine erysipelas, if the juices expressed from various tissues or organs of an animal suffering with the disease be rendered sterile and used to inoculate healthy animals, that the animals thus inoculated receive immunity if exposed to the disease. (München Medicinische Wochenschrift, May 12 and 19, 1891).

This method has the great advantage over Pasteur's inoculations with an attenuated virus of the disease in that it is immediately available for use in an outbreak, and that animals not already attacked by the malady may be saved, while in Pasteur's preventive inoculations the animals require inoculating with viruses of varying strength before the disease appears among them.

In this country farmers are apt to be careless and feel no anxiety about the danger of a contagious disease until it actually appears among their animals, when it is too late to apply Pasteur's inoculation, but this new method of inoculating with ptomaines might avail.

This means of preventing disease is based upon the theory that the results of infectious diseases are caused quite as much by the poisons produced by the bacteria, as by the micro-organisms themselves, and that immunity is due to a changed condition of the cells of the body caused by these ptomaines, which gives them the power to resist infection again for a period of considerable duration. Now, if we can introduce the ptomaines without the bacteria producing them we give the animal economy immunity from the action of the disease-producing germs.

Tuberculosis is a peculiar disease. Its tendency is to invade organ after organ, producing irreparable structural changes until death finally comes to the victim's relief, and although many cases appear to recover when placed under proper hygienic conditions, we do not know whether the disease becomes only latent until conditions become favorable for its development, or whether one attack, if the patient really recovers, gives immunity from another. In fact, one attack of tuberculosis seems to

predispose to another. Hence, a means of treatment which may be successful in ordinary infectious diseases, where there is a natural tendency towards recovery, and a restoration of diseased organs to a normal condition, may fail of useful results in such a malady as tuberculosis.

While the study of the application of ptomaines as preventives of infectious diseases is yet in its infancy, we must not forget the great boons conferred upon mankind and animals by Pasteur's methods, chief among which is his anti-rabic inoculation. This is brought home to us with especial force because we have now established in New York a Pasteur Institute where the principal work done up to the present time has been the preventive inoculation of persons bitten by rabid dogs, or dogs supposed to have been rabid.

The Pasteur Institute of New York, under charge of Dr. Paul Gibier, with Dr. C. Van Schaick as assistant, and Dr. A. Liautard as consulting veterinarian, was opened for the treatment of persons bitten by rabid animals, February 18, 1890, and during the year ending February 18, 1891, 828 persons presented themselves for treatment. Of these it was demonstrated that in the cases of 643 persons the animals attacking them were not mad, and they were not subjected to treatment.

"In 185 cases the anti-hydrophobic treatment was applied, hydrophobia of the animals which inflicted bites having been evidenced clinically, or by the inoculation in the laboratory, and in many cases by the death of some other persons or animals bitten by the same dogs. No death caused by hydrophobia has been reported among the persons inoculated." (Dr. Gibier's first annual report.) The following is a list by States of those treated :

New York,	-	-	-	81	Pennsylvania,	-	-	-	5
New Jersey,	-	-	-	27	Maryland,	-	-	-	3
Massachusetts,	-	-	-	16	Missouri,	-	-	-	3
Connecticut,	-	-	-	11	New Hampshire,	-	-	-	2
Illinois,	-	-	-	9	Texas,	-	-	-	2
Georgia,	-	-	-	5	Kentucky,	-	-	-	2
North Carolina,	-	-	-	5	Ohio,	-	-	-	2

One each from Maine, Arizona, Minnesota, Iowa, South Carolina, Nebraska, Rhode Island, Arkansas, Virginia, Louisiana, Indian Territory, and Ontario.

Those who could not afford to pay, were treated free of charge.

This is a good showing for its first year's work, and the amount of misery and suffering saved to humanity by Dr. Gibier and his confrères is incalculable, and yet this institution has no endowment fund of any kind, and no outside assistance whatever, and its charity work comes directly out of the pockets of those connected with it. This is not as it should be, and we, as the veterinary body of this country should assure Dr. Gibier of our sympathy in the great work in which he is engaged, and do all in our power to secure for him the recognition he so richly deserves, and for the Pasteur Institute that pecuniary aid which it stands so much in need of.

One suggestion in our last annual report has already borne fruit in Massachusetts. It was that portion relating to the condition of the United

States Army veterinarian. A friend of our profession, to whom I submitted a copy of my report as chairman of the committee a year ago, who is a member of the present legislature, and very much interested in military matters, presented a bill at last winter's session of the Massachusetts Legislature, providing for the appointment of a veterinary surgeon upon the staff of each batallion of Cavalry or Artillery in the Massachusetts Volunteer Militia, to rank as a 1st Lieutenant, "For," said he, "Massachusetts has taken the lead in a number of military reforms which have afterwards been adopted in the regular army, and this is a chance to bring about a reform in this respect."

The bill became a law, with the result of the appointment of two veterinarians, one to the batallion of Artillery connected with the 1st Brigade, M. V. M., the other to the batallion of Cavalry connected with the 2d Brigade, M. V. M., the first two veterinarians, so far as I know, to hold commissions as officers in the United States. Let us hope they will not be the last. Unfortunately the artillery veterinarian is but a second years' student at the Harvard Veterinary School, but I hope that by another year he will be a full-fledged M. D. V. The Cavalry veterinarian is your humble servant. It is to be desired that members of our own profession and their friends will continue to work to bring about official recognition of our profession in various ways in the different States. What progress has been made towards establishing a veterinary department in the United States Army, you will doubtless be informed by the committee having this matter in charge.

In concluding this report, I believe that the Bureau of Animal Industry should receive a little of our attention. I thought of calling your attention to it a year ago, but my paper then seemed so long that I decided to defer what I had to say until a future occasion, and am now glad that I did so, as it has given me an opportunity to beard the lion in his den, so to speak, which I always prefer to do, if the opportunity permit.

We have connected with the United States Department of Agriculture, the Bureau of Animal Industry. Its chief is a veterinarian, and a large number of his assistants are also veterinarians. It is the only department in which the United States Government officially recognizes the veterinary profession in a manner that at all appeals to our self-respect, and as the great veterinary organization of this country, we naturally take much interest in its work and usefulness. We are better able, perhaps, than anyone else to criticise its actions and results, being, as we are, specially educated on the subjects with which it has to deal. We have the same right as the rest of the people to commend the action of our servants, or to find fault with the way in which they conduct their work, besides which, by our special training, we are in a position to feel that we have a peculiar right to show our approval, or our disapproval, as the case may be, of the labors of this Bureau.

Of the practical work of the Bureau of Animal Industry I shall have little to say. It has almost eradicated contagious pleuro-pneumonia from this country, and in time will undoubtedly succeed in its complete extinction. For this service alone it deserves the thanks of the people, and has repaid many times over every cent that has ever been appropriated by

Congress for its support, including all it has expended in other directions. These results could have been obtained by any good veterinarian possessed of tact and administrative ability. When we come, however, to a consideration of its scientific investigations, we cannot say a great deal for its efficiency.

If we review as briefly as possibly the work done in the scientific investigations of swine diseases by the Bureau of Animal Industry, it will be quite sufficient to demonstrate to us the value of its bacteriological work and the credence to place upon any statements emanating from its officials.

If an exhaustive report were written upon the researches in swine diseases in the United States during the past few years, together with all the controversy that they have brought forth, quite a large volume could be easily filled. A year ago, when I thought of referring to this matter in my report, I should have based what I had to say upon an article by J. Amory Jeffries, M.D., which appeared in the *JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES*, for December, 1890, entitled "Etiology of Two Outbreaks of Disease Among Hogs," although my report was written before the article appeared in print, I was fully cognizant of its contents, having assisted Dr. Jeffries with the work, and in fact done a portion of it myself. Material which I have since been able to avail myself of only confirms me in the views which I then held, without changing them in any important particular.

The other articles of which I speak, and to which I would refer all interested in the matter, as time will only permit of my presenting the conclusions I have drawn from them, are :

"A Contribution to Our Knowledge of the Cause of Swine-plague, and its Relation to Connected Bacteriological Operations," by Dr. P. Frosch, (*Zeitschrift für Hygiene*, vol. 9, page 235,) Editors, Dr. R. Koch, and Dr. C. Flugge.

"Upon Our Knowledge of the American Swine-plague," by Dr. Theobald Smith, Chief of the Bacteriological Laboratory of the Bureau of Animal Industry. (*Zeitschrift für Hygiene*, vol. 10, No. iii., page 480.)

"Reply to the Preceding Work of Dr. Th. Smith, upon 'Our Knowledge of American Swine-plague,'" by Dr. P. Frosch, Assistant in the Institute of Hygiene of the University of Berlin. (*Zeitschrift für Hygiene*, vol. 10, No. iii., page 509.)

Also at a meeting of Scottish Metropolitan Veterinary Medical Society, held in Edinburgh, February 25th, 1891, Mr. Thomas Bowhill, M.R.C.V.S., read a paper upon "Swine Fever." Vide *Veterinary Journal*, May, 1891. To sum up :

Jeffries concludes that Billings' "Swine-plague," and Smith's "Hog Cholera" germs are identical, and differ from those of the disease he has investigated ; and that cultures Smith sent him of his "Swine-plague" germ are identical with the disease germs that he (Jeffries), has been studying, which produce a septic pneumonia in swine that they can communicate to calves, and very probably to lambs, sheep and other animals.

In short, the much-vaunted "Swine-plague" is simply a septic disease which is not peculiar to swine by any means. It is caused by one

of a large group of bi-polar organisms, capable of producing similar symptoms in such small experiment animals as are susceptible to them. Jeffries concludes by saying : " But while only two germs of this class are known to infest hogs in the United States, there may be others in Europe, *e. g.* ' Wild seuche. ' "

I think that Jeffries' work is particularly accurate and very valuable, and am surprised that it has not attracted a great deal of attention, although it does not seem to have done so.

Dr. Frosch, in his first article, compares the work done by Billings with the work supposed to be Salmon's, and draws the following conclusions :

1. " The bacterium of Salmon's Hog Cholera, and Billings' Swine-plague are identical. "
2. " The same is the cause of the American Swine-plague, while the proof of an etiological relation of the bacterium of Salmon's Swine-plague to the first, especially to a second plague of like extent, has not yet been sufficiently demonstrated. "
3. " That the bacterium is identical with Selanders's Schweine-pest bacterium " (Selander's Schweine-pest being the swine disease of Sweden and Denmark) " but different from the bacterium of the German Schweine-seuche, chicken cholera, rabbit septiciemia and ferret plague. "
4. " The ferret disease is caused by a separate kind of bacterium and cannot be grouped with the rest. "

Dr. Smith's is a reply to Dr. Frosch's first article.

Dr. Frosch's second paper is a reply to Dr. Smith.

Mr. Bowhill's paper announces that he has found in cases of Swine Fever, in England, a bacterium identical with Billings' Swine-plague germs and that he has sent specimens to Billings, who confirms his discovery.

Here we have two excellent investigators, one in the United States, and one in Germany, confirming the identity of Billing's Swine-plague germ, and Salmon's Hog Cholera germ, and each one acting independently of the other while the third finds the same germ as the cause of the English Swine Fever.

Dr. Billings boldly announces that he found his germ of Swine-plague in July, 1886, among the first pigs that he examined in Nebraska, which had died of the disease.

Salmon, in his report for 1884, discovered a micrococcus as the cause of what he then called Swine-plague. In his report the next year he says it is due to an oval, motile bacterium. Later in some of his replies to his critics he attributes the discovery of this organism to his assistant, Dr. Th. Smith. Dr. Frosch says : " This circumstance not only readily explains the intrinsic contradiction of the reports for 1884 and 1885, but also seems to have influenced Salmons further investigations. "

In a special report of the Bureau of Animal Industry upon " Hog Cholera : Its History, Nature and Treatment, " issued in 1889, there is a short history of the investigations of swine diseases made in the United States, but we not find any mention of the name of Billings, although he discovered at once the bacterium which the chief of the Bureau of Animal Industry had been searching for years, and which he probably would

not have found for some time, if he had not had the help of an assistant whom he was not generous to credit with the discovery, and so let it pass as his own.

In the report of the Bureau of Animal Industry for 1886, page 20, we find the following statement :

"In view of the results of investigations which have shown the existence of two distinct infectious diseases of swine, perhaps of equal virulence and distribution, a change in the nomenclature becomes necessary in order to avoid any confusion in the future. Since these two diseases have been considered as one in the past, and the name Swine-plague and Hog-cholera have been applied indiscriminately, we prefer to retain both names, with a more restricted meaning, using the name Hog-cholera for the disease described in the last report as Swine-plague, which is produced by a motile bacterium, and applying the name Swine-plague to the other disease, the chief seat of which is in the lungs. This change is the more desirable since recent investigations have shown that the latter disease exists in Germany, where it is called Swine-plague (*Schweine-seuche*.)"

The following questions propound themselves to us after reading the above :

After speaking of the disease as Swine-plague for several years did the Chief of the Bureau of Animal Industry call Billings' Swine-plague, "Hog Cholera" for the sake of creating confusion? (Thus while apparently ignoring him, at the same time paying him the greatest possible compliment in the power of one man who seems to so admire another.)

If the name "Hog-cholera" was not used in place of Swine-plague for the purpose of creating confusion, why was a septic pneumonia of the pig termed "Swine-plague," unless it was for the purpose of causing still further confusion? When, as we have seen, the disease is not confined to swine, but a little careless study would have shown that pigs could easily communicate it to other species of animals. Dr. Frosch pays the methods of bacteriological study pursued in the laboratory of the Bureau of Animal Industry the deservedly high compliment of doubting any "etiological relation of the bacterium of Salmon's "Swine plague" to the pest, especially to a second plague of like extent."

But Jeffries' work removes all doubt upon this matter, and we know that the Bureau of Animal Industry has found another disease of swine, which is a septic pneumonia, and is not alone confined to swine, and which for some reason or other they choose to term "Swine-plage." Furthermore it is not impossible that one animal may be infected with both maladies simultaneously.

The so-called Swine-plague of the Bureau of Animal Industry is one of those septic diseases due to filth, and is seen chiefly where putrefying city swill is fed, and farmers around Boston find that if the swill is boiled and then fed before there is time for putrefactive process to commence again that they are not troubled with it. In this respect it resembles closely the German *Schweine-seuche*. If this be a true Swine-plague, make the most of it.

Dr. Smith's article is as I have said in reply to Dr. Frosch's first article. In it he attempts to uphold the work done under the auspices of the Bureau

of Animal Industry, and to throw discredit upon the work done in Nebraska, and also to answer the criticisms in Dr. Frosch's first article.

Dr. Frosch's reply to Dr. Smith has its chief interest in his closing sentences. After briefly answering Dr. Smith's remarks, and saying that there is no need of his defending Dr. Billings, as he is abundantly able to defend himself, Frosch ends with: "From the present publication of Smith's, however, which could not be seen in reading the reports of the Bureau of Animal Industry, it is evident that Salmon was not the discoverer of either the 'Hog-cholera' germ or that of the 'Swine-plague' so now we know the condition of things in that regard."

Whether Frosch's feelings of admiration for the honesty and generosity of the pseudo-scientist whose work he supposed he was reviewing when he wrote his first article were equal to his feelings of pity and contempt for the assistant, who was obliged to give the credit for his hard work to his chief, or lose his official head, and yet serve as a pillar for his doughty chief to hide behind in case of an attack, I leave to your imagination.

You will see that Jeffries in his paper gives Smith the credit for the work he has done. It has been no secret to me for the last year and a half as to who was actually conducting these investigations in the Bureau of Animal Industry. Having taken the investigation of swine diseases as a fair sample of this Bureau's scientific labors, are we to be expected to place any dependence upon the accuracy of the statements emanating from its officers concerning such work, especially when they conflict with the results obtained by men like Paquin and Billings, unless the work of the former is confirmed by experiments conducted by independent and unprejudiced observers of recognized ability?

How can we as a profession feel anything but disgraced when we think of the opinions which must be held in Koch's laboratory, the greatest bacteriological laboratory in the world, concerning our Bureau of Animal Industry, and its scientific work?

I do not wish anyone to think that I have taken up the cudgels in Dr. Billing's behalf. Scientific research is the search after truth, and work that is recognized as good abroad cannot be ignored at home, no matter what the personal feelings of one man may happen to be towards another. No one deplores more than I the personalities that so often pervade the writings of the investigator employed by the State of Nebraska, that have done so much to detract from the dignity of his work, which I believe to be really correct and valuable, and it must be borne in mind that blaguardism does not add to the weight of argument. On the other hand a lack of honesty and straightforwardness is equally bad or worse, and modern political methods are not to be tolerated in the conducting of scientific researches.

The former style of writing shows what it is on the face of it. The latter often hides a good deal beneath its surface. One is like the rattlesnake which gives warning when it is about to strike. The other is more dangerous, like the deadly moccasin, which strikes its fangs into its victim without giving any indication of its presence.

If the Bureau of Animal Industry is to be a political organization, why not have its chief simply write the letter of transmissal of his annual report

to the Secretary of Agriculture, and have a few true scientists in its employ to work unhampered, and make their own reports upon the questions that they have been studying upon. This at least for the sake of making a more creditable appearance to other civilized nations, if we have no respect for ourselves.

More could easily be added of adverse criticism upon the management of the Bureau of Animal Industry, but enough has been said for the present, and it does not seem advisable to continue this report to too great length.

In conclusion, I wish to heartily express my thanks to my confrères upon this committee for the valuable assistance they have rendered me in obtaining material for this report.

AUSTIN PETERS, M.R.C.V.S.,

Chairman.

The Secretary announced that several photographers had made application to take the photograph of members of the convention at no cost to the association, but that such members as wished a copy of the photograph could purchase the same. At this point (forty-five minutes past twelve o'clock) the meeting took a recess until two o'clock P. M.

AFTER RECESS.

At the expiration of the recess the Convention met. The President announced that the next order of business was the report of the Finance Committee. That report went over for the present and the President called for the report of the Committee on Diseases.

Dr. Michener. As Dr. Butler, the chairman of the committee, has not sent any communication to me as the second member of the committee, I take it that there is no report to be made.

The President. The next report in order is that of the Prize Committee. (No report was offered).

The report of the Special College Committee was called for, but its reception was postponed for the present. The next call was for the report of the Committee on Army Legislation.

Dr. Miller. I beg leave to offer an apology. I have been unable to make any headway in the matter of Army Legislation, although I have done considerable work myself unassisted by other members of the committee. I am, therefore, unable to make any report that would be of any particular interest to the association. I shall, however, read that little which I have collected together in my investigation of the matter, and will

conclude by making some suggestions for the views of members who may be present as to future legislation.*

The President. We are now ready to hear the report of the Publication Committee.

The Secretary. Read the report as follows ; which was received for discussion :

PUBLICATION COMMITTEE.

Mr. President and Fellow Members :

As Chairman of your Publication Committee I would briefly report that through the work of our stenographer at Chicago, we were enabled for the first time in our history to have a complete report of our transactions. This entire matter has been placed at your command during the year through the kind courtesies of the *American Veterinary Review* and JOURNAL OF COMPARATIVE MEDICINE OF VETERINARY ARCHIVES. The good these journals have done for us cannot be properly estimated at this writing, and their generosity should receive our just recognition. The magnificent work of the *American Veterinary Review* in its special number, containing in entirety the whole work of our meeting of 1890, the most memorable in the association's history, will prove a valuable record on our library shelves for years to come. It seems to me that some such plan as the "Review Special" should be yearly adopted hereafter, as it seems unfair to ask so much space of our veterinary publications, and especially so when appears simultaneously the same matter in corresponding numbers of our journals. The publication committee of the future might well consider the advisability of this suggestion and thus leave to the work of our literary representatives the proper criticism and deductions of our work, that shall lead our efforts to higher and better results.

I want to acknowledge here with profound appreciation the generous gift of the editor of the *Review* in favoring the association with some three hundred and fifty copies of its special edition. A large part of this number has been sent forth to those who were not members of our organization and to other journals and bodies that would be led to an interest in our work as fellow veterinarians and as citizens of various communities where we felt a need of stronger recognition and support.

During the year five hundred copies of list of officers, committees and members were printed, and a copy sent to each member. The remainder were used in calling attention to our existence among members of the profession who should be numbered among our workers. Others were sent to various commercial sources, from which emanate articles of commerce of interest and use to us in our profession, that you all might be kept posted on the entrance into use of new veterinary literary productions, new remedies, new inventions and instruments, all of which I trust would aid and facilitate your daily routine of duties.

Much miscellaneous matter has been put forth by your committee,

* The report will appear later.

consisting of blank applications, blanks for signatures to constitution and by-laws, blanks for notifying members elect, etc., etc., all of which materially aid to a methodical manner for the transaction of our work.

W. HORACE HOSKINS, *Chairman.*

The President. The next order of business is the reception of the report of the Special Committee on Central Organized Body.

Dr. Robertson. As the second member of that committee I have no thing special to report in regard to the matter. It is a subject hard to understand exactly.

The President. The discussion of the reports will come up in their proper order. The next report to be received is that of the Special Committee on Food Inspection.

Dr. Williams. What I have to say, if not new to yourselves, is a subject that is new to me. I have to submit the following report :

NATIONAL AND INTERNATIONAL MEAT INSPECTION.

REPORT OF COMMITTEE.

Sanitary science in its entirety is one of the broadest, noblest and most ancient of all sciences. From the earliest ages much of the noblest thought, the deepest study, the most sympathetic and earnest endeavors have been designed either directly or indirectly to guard or improve the health of man.

The engineer who effectually drains a malaria-breeding swamp ; the architect who constructs a house with due regard to light and air, and free from disease-breeding drains or refuse receptacles ; the trained agriculturist or horticulturist who detects and destroys unhealthy vegetable food ; the veterinarian who controls or extirpates diseases of animals which by contact or through the use of the meat or milk are fraught with danger to the health or life of man ; the physician who applies scientific measures to control or extirpate disease in man ; and the great masses in close connection with these and many other human labors, all work upon a common ground, for a common purpose—human health and life—striving to vouchsafe to man his biblical three score and ten years with a healthful body and mind.

It is sometimes asserted that this or that profession is the most important of all, but each is vital and it is as difficult to measure or compare their value as it is to fix a price on human health or life.

Our ever changing social, political and geographical environments lead us to view with equally inconstant eyes the role of each of the useful sciences in relation to mankind, The one which proves most attractive

under certain conditions commands generally the greatest number of, and most zealous workers, while equally vital subjects are progressing but slowly or lying wholly dormant, until the favored branches have been enthusiastically advanced to a point far beyond that attained by the other correlative sciences, until the harmony of the whole is destroyed and the aims of the more advanced sciences are hampered or their progress impeded by the tardiness or deficiency of such branches as may from one cause or another have been suffered to fall far behind. At such times it becomes necessary to find sufficient earnest and competent workers to revive and advance the lagging member and bring it into line with other useful sciences.

During the whole period of human history probably no other vital science has been allowed to drop so far behind its associates, nor suffer so seriously from a long and baneful dormancy as the inspection and control of the flesh and milk of animal intended for human food, until at last the urgent necessity of the situation has forced itself upon the attention of the civilized world, and the demand has gone forth for zealous and efficient workers in the much neglected field, in so effective a manner that already much worthy and highly honorable labor is being done, by a rapidly and ever increasing band of earnest investigators, until we now have abundant promise that meat and milk inspection will soon occupy a highly honorable place in the front rank of the sciences holding a vital relation to human life, health and happiness.

Meat inspection is almost as old as human history and has been fundamentally influenced by religious, social, political and commercial usages. The early Jews enacted meat inspection laws upon an unusually high sanitary plane and enforced them under the sanction of religion and with all the rigidity and zeal of a sacred religious rite. The Jewish meat inspection ordinances apparently rest upon the Mosaic law, and now, centuries after the tables of stone have vanished from the sight of man, these meat inspection laws still seem as indelibly stamped on the mind of the orthodox Jew as they were during the days of Moses, and the civilized world looks with reverence upon the ancient customs and heartily wishes that essentially the same laws could be adopted universally and administered as faithfully and effectually as they were thirty centuries ago.

The necessity for meat inspection is so apparent and well-known to intelligent people that your committee scarcely feel warranted in dwelling even briefly upon this phase of the question. Recent study in connection with the so-called contagious and infectious diseases have demonstrated apparently beyond all chance of doubt that they are each due solely to special living organisms. The contagious diseases of man and animals are in many cases identical and intercommunicable, either by contact or by ingestion of parts of the diseased body by the healthy animal, and it is now a well recognized fact, unqualifiedly endorsed by all who are versed in either human or veterinary medicine, that the ingestion of diseased meat and milk is the direct cause of much disease and death in the human family. The practically universal use of meat and milk as human food in all civilized countries renders the question of their freedom from disease of pressing import to the health of the nation.

Meat inspection possesses great importance also in relation to national economy, as it affords the best and most available means for the prompt detection of the existence of contagious diseases among animals, indicates the location and extent of the infected area and enables the government to institute elaborate study into their nature and causes and the influence of climate, soil, and other environments upon them and to promptly apply remedies for their control or eradication.

In our opinion meat and milk inspection should be carried out primarily in the interests of the intended consumers of the food products and not, as is too often the case, in the interests of the producer.

It should constantly be remembered, however, that the unwarranted condemnation of healthful animal food or that which could economically be rendered sanitary, is a waste of food resources which no nation should tolerate, since by this waste the price of meat is advanced proportionately and thus rendered less and less available as a food to those who stand in greatest need of it—the poorer laboring classes.

The early Jewish meat inspection was carried out with especial reference to Jewish consumers and strictly forbade the use of the flesh of diseased animals as food for their own nation although it would appear from the Mosaic law that such diseased flesh could be sold to other nations, if they desired to buy. Their meat inspection partook of the character of a religious rite, founded, doubtless, on sanitary reasons well known to the Jewish priests. The religious phase of this inspection was probably highly essential to effectiveness, since religious reverence and awe constitute the main source of power in ecclesiastical governments. If an animal was concerned on account of tuberculosis, the greed of the owner could in no way be so effectually controlled and silenced as by the invocation of ecclesiastical law. At the same time under the tribal relations of the Jews he could probably evade the use of a part of the diseased animal for his own food, only with difficulty.

Among the great mass of the human family, where religious sentiment fails to enter into the question of human food, the consumer has slaughtered and inspected the animals intended for use as food in his own family or has relied upon the knowledge and sterling honesty of his butcher.

Recent social, political and commercial changes have seemed to separate farther and farther the consumer of meat from the producer, and a knowledge of its fitness for food becomes more and more difficult to obtain, until under our present environments the meat we obtain at a butcher's stall might appropriately be termed a mystery. An Eastern capitalist, who is in no wise learned in regard to the diseases of cattle, owns a ranch some three thousand miles distant in a western territory, which he visits at intervals of several years and leaves the sale of cattle to irresponsible men who neither know nor care whether they be healthy or not, and from his hands they are shipped two thousand miles to a great slaughter house, where the cattle are bought for the express purpose of slaughtering to sell again, and thence the meat is sold to a wholesale meat dealer in some distant city or perhaps several thousand miles away in some foreign country, then resold again to a retail butcher who finally disposes of it to the consumer. Until within the past few months this process has taken place in

this country under the solitary eye of the interested seller, solely from a mercenary standpoint, and leaving the consumer in the most absolute ignorance possible as to the source and sanitary condition of his meat supply. The meat consumers had thus reached the climax of ignorance as to their meat supply, and had attained the pinnacle of danger to which a people can be subjected through the use of diseased meat.

Other countries have in some cases quite old established meat and milk inspection laws and under the goadings of national enthusiasm and love of country, it has been reported that certain of the more highly civilized European nations have ample inspection laws which are effectually administered by a thoroughly trained and organized corps of inspectors.

In the matter of government meat inspection, Germany claims, and perhaps justly, priority in point of effectiveness, but if we are to judge the work of its fruits in the prevention of the transmission of diseases from animals to man; or by the evidence adduced by the highest German authorities themselves, they yet fall far short of an ample law effectively administered. If this can be said of Germany, still more may be asserted of other nations.

The prime obstacle to effective meat and milk inspection has ever been, and will continue to be, the irrepressible and unavoidable conflict between the mercenary interests of the seller and the sanitary interests of the consumer, and upon a scientific and practical adjustment of these interests must meat inspection rest, if it is to succeed.

In essentially all respects the interests of the producer and consumer are identical under a judicious meat inspection, and it is rather due to unscientific and irrational laws and actions that these interests are usually brought into violent conflict. Nutritious meat which is wholesome, or which can be readily rendered healthful, is as much, nay more, of a loss to the poor laborer than to the wealthy stock breeder or meat dealer, for while each carcass excluded from the market serves to increase the profits on those remaining to the seller, they invariably render the procuring of a suitable quantity and quality of meat more difficult for the poor.

Bollinger has well observed, "Were statistics available as to how many persons have died from insufficient nutrition, especially from the want of sufficient nutritive meat we would find a much larger percentage than from the use of the flesh of diseased animals for food." We are thus reminded by this very eminent authority that we should, for humane and national economic reasons, be exceedingly careful to not exclude meats which are or can readily be rendered highly suitable for human food.

We have already stated that meat inspection should be made primarily in the interests of the proposed consumers of such meats. When a Jewish Rabbi, either personally or through a duly authorized party, inspected the meat for a particular tribe or clan, and carefully guarded the interests, from a sanitary standpoint of his own tribe and kinsfolks, his work was accomplished, and the matter concerned only the immediate tribe. Civilization, with its centralization of power, and breaking up of small tribes or clans, and the organization in their stead of vast kingdoms, empires and republics, with the great commercial changes, has rendered the ancient Jewish laws in some

of its phases, inapplicable to our present needs. In our country, with our meat producing animals reared at one point, killed at a distant slaughtering center, and then distributed to every part of the union, the nation becomes the consumer of meat and so national meat inspection becomes a necessity. The people of the United States cannot consume the entire meat product of the nation, but have a vast surplus which it is desirable should be sold into foreign countries, where from the density of population or other unfavorable environments, there cannot be sufficient meat produced to supply the necessities of its people. In such event, if we would conform to the proposition that meat inspection should be primarily in the interests of the consumer, it is evident that, if we are to enjoy a large meat export trade, that the inspection of such food products must be so conducted as to properly guard the health and lives of those by whom the meat is to be used. To this end opportunity must be given to the importing countries to know that the inspection is skillfully and conscientiously performed.

It is possible that other than sanitary reasons may lead a state or nation to exclude from its markets the food produced of another. We recently witnessed the ineffectual attempts of certain states to exclude dressed meats imported from others by laws apparently inspired by the desire of the affected states, to protect their cattle raisers, and the assertion of Bollinger that, to his mind, more persons die from the want of a due amount of meat than from the eating of diseased meat, would indicate that some of the great meat importing countries of Europe, base their exclusion of foreign meats, upon political rather than sanitary causes.

Your committee, appointed largely for the purpose of continuing the study and discussion of Dr. Schwartzkopff's paper on "National and International Meat Inspection," read before this Association at its last meeting, find it impracticable to review every part of his production at length. We will pass over his remarks as to how meat inspection should be carried out, merely stating that we are in full accord with the author and believe with him that meat inspection should be only undertaken under just and sufficient laws, in conveniently arranged public abattoirs, and by qualified veterinarians, fully competent to measure the significance of pathological lesions, with which in the course of their duties they will meet, and that the inspection should be carried out by such persons and in a manner to properly guard the health, and command the confidence of the intended consumers.

It has been quite a common custom in many countries requiring meat inspection, to confide that trust to some political hanger-on whose qualifications rest solely upon political services rendered or promised in the future. It is evident however, to any intelligent person that this duty should be performed by a person well versed in pathology for, as Bollinger has well observed, "meat inspection in its highest sense is applied pathological anatomy."

The recently enacted United States meat inspection laws appear to be, in most respects, adequate and beneficent, and although it is as yet too early to speak of their execution, it is safe to predict that with experience and organization our meat inspection service will prove eminently satisfactory so far as our laws extend.

The law apparently has some imperfections which might be remedied with benefit. The provision in Sec., 7, of this act, which allows "farmers" a peculiar exemption from the general provisions of the inspection regulations and permits him to slaughter diseased animals, and transport the meat into other states, and sell it for human food, apparently nullifies, to a very dangerous extent, the beneficent provisions elsewhere found in the act, and offers inducements to the favored farmer to retain his diseased animals on his farm until slaughtered, and the more apparent evidences of disease are annihilated before offering it for sale.

The failure, perhaps incompetency, of this law to provide for the destruction of diseased meats, and barely excluding them from foreign or inter-state commerce tends strongly to vitiate and deteriorate the *inter-state* or local meat supply. In effect, the United States Meat Inspection law throws back upon the state any animal which may be unfit for human food, and unless the states maintain rigid meat inspection laws (and most of them do not) this provision renders our local meat supply worse instead of better, and benefits only the foreign or extra-state consumer. The Mosaic laws interdicted the use of diseased meats by the Jews themselves but permitted them to sell it to aliens, while our national meat inspection law reverses this order and forces diseased meats upon the local markets.

These provisions will doubtless lead to the enactment of other laws adapted to relieve local meat consumers' from this danger.

The mode of inspection is a question upon which most sanitarians readily agree. There are certain diseases of animals which admittedly render their meat unfit for human food and which being readily recognizable during the life of the animal warrants the inspector in condemning and killing the animal and destroying the carcass. Other animals require a post-mortem examination in order to verify a diagnosis or to discover diseases not discernable during life.

The principal question, the vital one in meat inspection, is what meat shall be excluded from use as human food? The recent meat inspection law of the United States, merely excludes the meat of diseased animals without enumeration or classification, and without dictating what use shall be made of the affected animals or their meat or food products.

Dr. Schwartzkopff, in his previously mentioned paper read before this Association, attempted a classification which to the mind of your chairman, seems quite arbitrary, impracticable and open to considerable criticism.

He divides the whole category of diseased animals into three classes :

(1) Diseases in which animals should be condemned, killed and the carcasses effectually destroyed, viz., Anthrax, Rabies, Septicæmia, Cattle Plague, Glanders, Small Pox in Sheep, Swine-Plague and Hog-Cholera, and Unborn animals.

(2) Diseases in which slaughter may be permitted to ascertain whether the whole or part of the meat is fit for human food, or to be used for industrial purposes, or to be destroyed, viz., Foot and Mouth Disease, Tuberculosis, Actinomycosis Bovis, Icterus, Milk Fever in Cows, Hydrothorax and Ascites, all Diseases which are combined with high Fever, General Emaciation and Debility, for instance, Pneumonia, Enteritis,

Uteritis, etc.; and over-heated and too young animals, which should be kept for further examination.

(3) Diseases only ascertainable after slaughter, and in most cases by the use of the microscope.

Under this head he enumerates the entozoa, known to affect meat-producing animals and one bacteriological disease—actinomycosis suis. How the essayist managed to draw his lines in such a manner is not understood by your chairman.

It is not clear to us why, under his first class—diseases in which animals should be condemned, killing and the carcasses effectually destroyed—he should place glanders, which in many cases cannot be diagnosed except post-mortem, nor hog-cholera, which in the chronic stage may in some cases closely simulate trichinosis, nor can we discover his authority for denominating an unborn animal “diseased” and condemning it to death and destruction.

Again, in his second class he would permit the slaughter of animals affected with tuberculosis, a disease admittedly transmissible to man, and might allow its meat to be sold as food, while under his first class he would exclude swine-plague and hog-cholera, which are certainly not transmissible. Again, he places septicæmia in his first class and destroys the carcass, while uteritis—which is septicæmia beginning in the uterus—he would place in the second class and perhaps allow it to be used as human food. He would kill a cow with milk fever in order to ascertain the suitability of the carcass for human food, when we cannot see what new guide for action would be revealed post-mortem. Under his third class, without stating or suggesting the line of action to be followed as to the use of the meat, he places actinomycosis suis, while all other bacteriological diseases, even actinomycosis bovis are placed in the other two classes.

It seems to your chairman that veterinary science is at present sufficiently developed to admit of and to demand a scientific classification of diseased or unhealthy meats, which without enumerating all diseases of animals would serve as a guide in the inspection of meat.

We would not attempt a classification upon the basis of the time at which the disease could be detected and determined upon, but would say that all animals intended for slaughter should first be inspected alive, and if there is sufficient evidence of disease to plainly warrant condemnation, the inspection evidently need go no farther, while in case such evidence is wanting, then permit slaughter and complete the inspection by the necessary post-mortem examination. We would attempt a classification based upon the source or rather the kind of danger which the diseased meat bears for man.

By such a scheme we would have four classes :—

A. Parasites of meat, most of which are capable of partial or complete development in the human body.

B. Non-transmissible diseases with variations of temperature enumeration or other grave pathological lesions and diseases due to micro-organisms or in the course of which micro-organisms develop, which do not find suitable media for growth in the human body and which, therefore, can only act

injuriously upon the human body through their exertions or productions or chemical poison due to their presence.

C. Diseases produced by micro-organisms capable of multiplication and growth within the human body and which also produce chemical poisons, which when consumed may produce toxic effects.

D. Bacteriological diseases transmissible to man, in which there is no danger from the ingested bacteriological products, but entirely from the living micro-organisms themselves.

We need not enumerate the individual classes under this method of arrangement.

Under Class A. we have a long list of parasitic diseases, which in meats offered for sale are mostly found in a natural state, or matured to the highest point possible in the host e. g., encysted trichinæ, larval forms of tænia, etc. and rarely effect the general condition of the body of the host, and can only injuriously affect the consumer by the ingestion of the living parasite. In such cases, thorough cooking of the meat under official control, renders it safe and only objectionable from a sentimental standpoint.

More rarely it happens that some of these parasites by invading vital organs may cause a general derangement of the system which by producing grave pathological conditions, fever, emaciation, anasarca, etc., as is seen in larval forms of tape worm in the brain; in strongyli of the lungs and bronchi in cattle and sheep, strongyli of the arteries in the horse, distoma hepaticum of cattle; or by wholesale migration to every part of the body, as in the first stages of trichinosis.

In all such cases the entire carcass, and in those where the parasites, although in a passive state, are yet so abundant as to be abhorrent, all infected parts of the carcasses of the affected animals should be not only condemned but rendered innocuous under official supervision since the condemnation of some kinds of parasitic meat and allowing it to be consumed raw by dogs or other lower animals, renders the extermination of such diseases impossible and not infrequently only gives the parasite opportunity to undergo one more stage of development, and return to man in a far more dangerous form than that found in the condemned meat.

Consequently, provision should be made for the complete destruction of these animal parasites before the condemned meat passes from official control.

Under Class B, we place the flesh of animals diseased from a malady not transmissible to man, but which may contain chemical substances, ptomaines or other organic substances, which when ingested may produce serious constitutional disturbances. Included in this class we find a large number of sporadic affections accompanied by variations in temperature, nutrition, etc., of a more or less grave character, as in ordinary pneumonitis, pleuritis, enteritis; etc. It includes also a long list of contagious diseases of animals, among which we find the most destructive epizootics, exerting in most cases great influence on our national economy. Among these are contagious pleuro-pneumonia, hog-cholera, and closely allied diseases, texas fever, and many similar affections. We believe it to be generally conceded that in all this class the flesh of such animal is only rendered dangerous as human food when the disease-processes have attained such a

stage as to produce a decided variation of the body temperature, marked emaciation, or other grave pathological conditions, in which cases the meat should be absolutely condemned as human food and only permitted to be used for industrial purposes, after the carcass had been rendered innocuous (in case of contagious disease) to the lower animals.

Class C, might with profit be divided into two rather distinct sub-classes :

1st. A group of what we might term "sporadic" infectious diseases, such as pneumonia, pyo-thorax, pyæmia, septicæmia, uteritis, septic enteritis, pyo-septhæmia or omphalo-phlebitis of new born animals, recent infected wounds, etc.

This includes one of the most important classes of diseased meats in the entire category, although from their nature they are of comparatively little concern to our subject proper—national and international meat and food inspection—because they are ordinarily slaughtered for local use. Bollinger has well observed that of all authenticated cases of death from the consumption of diseased meats, that 80 per cent. were due to the use of flesh from "nothgeschlacteten thieren," or animals slaughtered when death from other causes was imminent, in order to avoid financial loss to the owner. These animals, slaughtered under urgent necessity, belong almost, if not wholly, in this sub-division or rather they constitute it.

In our second sub-class we include the epizootic contagious diseases of animals which are transmissible to man, and which also produces within the animal body ptomaines or other chemical products of a dangerous toxic nature. Rabies, Anthrax, acute and constitutional Glanders, Tuberculosis and Actinomycosis.

The entire carcass of animals coming within this class should evidently be destroyed completely both for sanitary and economic reasons.

Under Class D, we would place three closely allied affections which constitute the most stubbornly contested field in veterinary and medical sanitary science, having engaged the attention of sanitarians for years and promising yet much controversy ere the questions are settled. Upon this class your committee has found it impossible to agree.

This class includes, in our present state of knowledge, three diseases or rather a form of three of the maladies enumerated under the second sub-class of Class C.

They are the chronic local, or perhaps more properly, latent form of glanders, tuberculosis and actinomycosis. They have many characters in common, so much so that we have been enabled only recently to differentiate them. Actinomycosis was long known in one form as glanders of cattle, in other forms as tubercular stomatitis and tubercular enlargement of glands, while in man actinomycosis was known as a variety of tubercular affection. All are peculiarly widely disseminated over the world, and in many cases exceedingly latent or passive, often discernable only by post-mortem inspection, may exist in certain individuals for an almost indefinite time without inducing noticeable constitutional disturbances, they will have a predilection for the lungs and lymphatic glands, gain their admission to the animal economy and effect their extension largely through these. The micro-organisms are highly gregarious in their habits, and have a great

tendency to become encysted in various sized cysts with fibrous and fibro-calcareous walls. This encystment renders the enclosed micro-organisms passive, or rather in many cases they retrograde and even perish, and thus in all cases through this encysting process a large portion of the bacilli, sometimes so far as we can discern all of them, become so encysted and render the affection wholly latent, and later these bacilli may largely or wholly perish and recovery of the animal follows, and in two, if not all three, diseases with impunity from future attacks.

All are transmissible to a wide variety of animals and the micro-organisms thrive in vegetable media. In a healthy animal the digestive processes are usually fatal to the etiological moment.

The transmissibility of glanders to man and the dangerous character of glanders-affected meat for human food is, we believe, universally conceded.

The contagious character of tuberculosis among the lower animals has been well attested in every possible respect. 1st, By clinical observation. 2nd, By experimental transmission. 3rd, By the production of immunity from subsequent exposure. Its identity in the various lower animals and in man rests upon as thoroughly tested a basis as is recognized in medicine and the inter-transmissibility between man and animals has been equally well established. Space forbids that we should consider the question of the fitness of meat of mildly affected tuberculous animals for human food beyond the general conclusions as to the entire class.

The third affection in this class, actinomycosis, constitutes, at present, the most stubbornly contested ground in the whole question of meat inspection from a sanitary standpoint, and it has been found impossible for your committee to agree. Consequently your chairman has felt compelled to present his personal views in the body of the report and has asked Prof. Schwartzkopff to give as completely as possible the contrary phase.

The fundamental point upon which rests the classification herein proposed is the question of the contagiousness of actinomycosis. What constituted a contagious disease? Based upon the derivation of the word and the knowledge of the class of diseases to which it has been applied, it has been held to signify a malady transmissible by contact or approach.

Later developments in medical knowledge have gradually led us to apply this word in a more restricted sense excluding internal and external animal parasites and meaning more particularly those highly contagious affections due to the invasion of vegetable micro-organisms.

We would then say that in the present light of medical science when speaking of contagious diseases in a restricted sense that we apply the term to those affections due to the invasion by a micro-organism, of a more highly organized body, wherein the invading organism finds all the conditions and environments essential to its growth and reproduction and in which the newly generated organisms are capable of attaining the same degree of development and maturity as the initial invading entity and hence becomes capable of transplantation to other analogous organisms. In other words, if glanders bacilli are introduced into the living tissues of a soliped not previously rendered immune, and they multiply and the new organisms attain the same development as that possessed by the bacilli constituting

the initial inoculation, then these new bacilli must be equally capable of transplantation with the old and hence under the present meaning of contagion glanders is contagious.

During the discussion of Prof. Schwartzkopff's paper on meat inspection he says: "As to the question of actinomycosis, as I said before, theoretically, it is not contagious. . . . I do not believe it is contagious, and I base my opinion on my own experience as well as my theoretical studies in handling cattle in the Berlin slaughter houses." The basis for Prof. Schwartzkopff's conclusions seem to your chairman somewhat vague.

We fail to comprehend how in ordinary routine work in a Berlin slaughter house, a disease can be classified as contagious or non-contagious. He has not given us any data from his theoretical or practical knowledge of the disease which throws the least light or reason upon his conclusions.

Your chairman, in unison with most veterinarians throughout the world, believes it is contagious and predicates our belief upon the following facts, which will probably be admitted by Prof. S.: (Am. Vet. Rev. Vol. XIV. P. 495)

1st. Bacteriologists, so far as we can learn, universally agree that the micro-organisms found in actinomycosis at lungs, lymphatics, liver, bowels, muscles, etc., of lower animals and man are all identical, with the reproduction of the actinomyces found upon various forms of vegetable food; that in these groups of actinomyces in the affected animal body are to be found micro-organisms identical in morphology, maturity, vitality and reproductive power with the actinomyces found on plants.

2d. It is universally agreed that actinomycosis is due to the invasion of and multiplication in the animal body of these actinomycosis or ray fungi. Under the definition we have proposed for *contagion* these two factors render this disease contagious.

3d. It is generally, if not universally, admitted that actinomycosis originates in animals through the lodgement and multiplication of actinomyces in wounds or abrasions of the skin or mucous membranes—probably in some cases by the inhalation and lodgement of the fungi in the air cells. This fact rests upon abundant and authentic clinical records.

Observations of the disease in man, where the history is traceable, makes it evident in every case that the disease was due to infection through external wounds. Dr. Bodamer, (1) relates a case in a miner where the infection was evidently due to the introduction of actinomyces into a wound. Dr. Schimer, (2) records a case in man referable to wound infection and also Ponfick (3).

Other recorded cases in man are strongly suggestive of inoculation during mastication of actinomyces containing food by means of abrasions of the gums and about the teeth. Compare cases recorded by Dr. Murphy; *N. Y. Medical Journal*, 1885, p. 17; Dr. Conover, *Journal of American Medical Association*, 1885, p. 608; Isarel in *Virchow's Archives*, Vol. lxxiv;

(1) *Journal of Comparative Medicine and Surgery*, Vol. x., p. 182-199.

(2) *Chicago Medical Journal and Exchange*, Vol., v. fol., 359.

(3) *Actinomykosen des Menschen*, Berlin. 1882.

Ponfick, *De Aktinomykose des Menschen*, Berlin, 1882; Rosenbach, *Centralblatt für Chirurgie*, 1880.

Were the history of inception of actinomycosis of the internal organs of man available, they too would doubtless exhibit distinct evidence of inoculation through a wound, abraded or extremely delicate membrane, after ingestion or inhalation of actinomycetes.

Clinical observations of veterinarians in connection with the origin of actinomycosis in animals indicate clearly and beyond contradiction that the disease is due to the translation of the ray fungus from some other organism to a wounded, abraded or extremely delicate surface.

Once the micro-organisms have invaded a wound and have found suitable ground for their growth and multiplication, it is admitted by all scientists that new crops, without known limit as to number, generate, mature and perish, while the disease spreads and augments or sometimes declines in varying degrees,

These propositions are admitted, so far as is known to your chairman, by all scientists whether they believe the disease contagious or non-contagious.

4th. Experimentation, the crucial test as to the transmissibility of a disease, fully bears out the above facts. John (1), transmitted the disease by inoculation in 75 per cent. of trials with fresh material from a diseased animal.

Ponfick (2) likewise succeeded readily in transmitting the disease in cattle by intra-venous and subcutaneous injections, but failed to transmit it by feeding the fungus to cattle, and had negative results in inoculations in dogs and rabbits. Bodamer (3) records six successful inoculations out of thirteen trials with dogs, cats and rabbits - animals apparently only slightly susceptible.

Israel (4) and Kotter succeeded in inoculating rabbits with actinomycetes from man, while Cruikshank (5) had a similar result from inoculating cattle with the fungus from an affected man.

Clinical observations lend strong support to the theory of the transmissibility of the disease from animal to animal. Casewell (6) reports an extensive outbreak of actinomycosis in cattle and hogs bearing strong evidence of indirect transmission from animal to animal by means of food soiled with discharges from actinomycotic abscesses of an affected animal. Your chairman has observed similar instances where 50 to 75 per cent. of a cattle herd was found affected, apparently due in a great measure to transmission in this way from animal to animal. In company with Casewell and other veterinarians (7) we saw an extensive outbreak in the distillery cattle

(1) John, *Actinomykosis Bericht ueber d. Veterinarwesen im Konigreich Sachsen*, 1881.

(2) Ponfick, *Die Aktinomykosis der Menschen, eine neue infectiosos-krankheit*, Berlin, 1882.

(3) *Journal of Comparative Medicine and Surgery*, Vol. x. p. 120.

(4) *Centralblatt f. Bacteriologie u. Parasitenkunde*, B. LII. No. 14, 1888.

(5) *Annual Report Agricultural Department, England*, 1888.

(6) *Am. Report State Board Live Stock Company, Illinois*, 1890.

(7) *Special Report State Board Live Stock Company, Illinois, (Actinomycosis in Cattle)*, 1890.

sheds of Peoria, Ill., in 1889, where inter-transmission apparently played a very important role. The extension of the disease seemed due to the fact that badly affected animals were kept in the sheds with the healthy, large abscess about the throat and jaws being irritated and abraded by contact with high mangers, discharged large quantities of actinomycetes, containing pus, into the troughs along which flowed the slops to neighboring cattle, and the inoculation of the healthy cattle was favored by their being supplied with very coarse, hard wild hay, which evidently served to abrade the mouth and pharynx.

A long list of the leading scientists of the day might be quoted, who believe in the contagiousness of actinomycosis, such as Bollinger, Ponfick, Johne, Friedberger, Frohner, Rosenbach, Bizzozero, Lindquist, Heller, Peroncito, Ochsner, Crookshank, Fleming, Liautard, Law and others, almost without number. In fact it seems, in so far as your chairman has been able to learn, that contributors alike to standard and current veterinary literature of a recent date all are agreed that the affection is contagious. We understand that Prof. Schwartzkopff and other dissenters have given voice to their theories and deductions through the columns of the agricultural or live stock press, and avoided placing their views in form or place where it would come within proper range of scientific criticism. We trust that now, for once, Prof. Schwartzkopff and his colleagues will present their non-contagious theory of actinomycosis before this convention, from a scientific standpoint, and permit their arguments to be weighed upon a strictly scientific as well as practical basis. We desire that Prof. Schwartzkopff should fully explain his statement at our last meeting that he predicated his belief of the non-contagiousness of actinomycosis on his theoretical studies, and his practical work in the great abattoirs of Berlin. What great veterinarians of Berlin taught our fellow-committeeman that actinomycosis was non-contagious while such Germans as Johne, Ponfick, Rosenbach, Friedberger and such veterinarians of the great Berlin Thierarztlichen Hochschule, as Frohner unitedly and without fear or apology denominate the disease as infectious? What facts has he learned in the slaughterhouses of Berlin that demonstrate the non-transmissibility of the disease?

Granting the transmissibility of actinomycosis and thus supporting the above classification we are prepared to consider the three members of the group jointly in their relation to meat and food inspection. The use of the flesh of solipeds has not gained sufficient popular sanction in this country to warrant us in consuming your time by referring to glanders.

Admitting the identity of human tuberculosis and actinomycosis with these two diseases in lower animals and the proof of their transmissibility, the question which confronts us is, what, if any parts of affected animals are safe for human food or can be readily made inoculous?

Upon this question there is a great variation of opinion, rendering any definite conclusions, which would be acceptable at all, extremely difficult, if not impossible.

We have taken the stand that in these chronic or passive forms or disease, the sole danger to the consumer of the meat or milk of affected animals exists in the living, virile micro-organisms so we are at once

brought to enquire in what parts of the animal body do the germs exist and in what parts are they absent.

Many contend that only those parts which are evidently affected should be condemned and destroyed. This is apparently the idea of Dr. Schwartzkopff in relation to tuberculosis in his remarks on his paper of last year, but a careful study of his utterance leaves one in doubt as to his real belief.

The warrant for the custom of condemning and destroying parts evidently affected with one of these maladies and allowing the remainder of the carcass to be used for human food must rest upon one or two propositions: 1st, that the micro-organisms exist only in those parts where their existence is plainly evidenced by the agglomerations or, 2nd, upon the theory that meat from a diseased animal must be considered innocuous until the presence of the infecting element in the part in question has been fully demonstrated.

It must be admitted with regard to the first position that these germs may exist in agglomerations in parts of the animal not usually seen by the inspector, *e. g.* meningeal tuberculosis. There is further very good evidence that the germs of these maladies are transmitted from part to part along the natural course in the lymphatics. This is very nicely shown clinically in actinomycosis in man and cattle. In the latter the origin of actinomycotic abscesses in the lymphatic glands in the region of the throat can frequently be clearly traced post mortem to an initial inoculation in the pharynx which has nearly left sufficient trace of invasion to demonstrate the role which this part has played as the point of inception of a disease which is to find a suitable field for development only after the etiological moment has traversed for a comparatively great distance through the channel of a small vessel. We observe this lymphatic transmission most beautifully in actinomycosis of cattle, beginning at or near one of the feet and slowly but steadily moving along the course of the lymphatic vessels, destroying by suppuration the glands, some of the germs even succeeding in passing these sentries ere their destruction prevents further progress, continue their ravages toward the central portions of the body. Evidently the actinomyces are usually some distance in advance of macroscopical pathological changes and we cannot judge to what extent a part is invaded except by an utterly impracticable and laborious microscopical examination with but little warrant of reliability.

The migration of tubercle bacilli and actinomyces through the blood vessels seems to be proven beyond reasonable doubt.

It is true that with but a few years study of these diseases we have recorded but few evident cases of such transmission but we feel that they quite suffice to overcome negative testimony although possibly far more voluminous.

Friedberger and Frohner (1) say that it seems possible that actinomycosis can be disseminated by means of the blood, while in case of tuberculosis (2) they assert that it may and does extend in diverse ways. 1st, By the lymph channels; 2nd, By continuity or contiguity; 3rd, By the blood

(1) *Pathol. u. Therapie. d. Haustiere*, Bd. II, s. 545.

(2) *Ibid.*, s. 505.

circulation. This blood infection and extension happens by the rupture into blood vessels of tubercular nodules or tubercular affection of the vessel walls. It is well shown when the bacilli are excreted in the milk from an apparently healthy udder. Hamburger (1) cites a case of actinomycosis in a colt one and one-half years old contracted presumably during decubitus through wounds produced by splints applied to correct rachitic deformity of the legs, in which in bones and cartilage and finally in the arteries themselves were found actinomyces.

We are forced to conclude therefore that once an animal is affected in a local or passive form with one of this group that we have no reliable means at our command for determining that apparently healthy parts are in reality sound.

We believe further that it is the duty of the meat inspector rather to be able to say if meat is *fit* for use as food than *unfit*. Where question is raised as to the fitness of given food, we hold that the consumer should be granted the benefit of the doubt, and that the inspector should be able to say unreservedly that the meat is wholesome before he permits it, upon his sanction, to be sold for human food.

The recently enacted United States meat inspection laws are as precise, with all their brevity, as can well be devised. It makes simply and only two classes of meats—those from well and diseased animals. The former is passed as wholesome, the latter rejected.

This is the true, safe line, and affords between the flesh of animals dead from disease (which all civilized people abhor as food) and that of healthy animals a neutral ground, which should act as an effective barrier to the use, though the greed of sellers of this repulsive and dangerous food which with our present laws is yet rendered possible in our local markets.

The meat of animals slaughtered at a time when death from disease is imminent, cannot be considered preferable to those which have died from the ailment. What possible difference can it make from a sanitary standpoint if a cow with parturient apoplexy is slaughtered or allowed to die from the disease one half hour later?

The neutral ground—disease—between health and death is one which the meat inspector should enter with caution, and so we do not hesitate to assert our belief, predicated upon the foregoing reasons, that the meat of diseased animals of this group should not, under ordinary conditions, be passed as wholesome food.

As we suggested at the outset, however we are equally firm in our belief that from the standpoint of humanity and national economy we have no right to destroy wantonly and uselessly such an enormous food supply as the unqualified destruction of these meats would entail. Since the whole danger in the consumption of these meats rests upon the presence, or possible presence within the parts used as food of living, transplantable micro-organism, it is evident that any process to which it can be subjected without destroying the nutritive value, and yet effectually and beyond all doubt destroy the micro-organism, will render the flesh *sound* from a strictly sanitary standpoint. Consequently, we would say that the apparently

(1) *Holl Zeitschrift f. Thierheilkunde*, etc., Bd. 16, Lf. 2 and 3.

healthy parts of such diseased animals should be thoroughly and effectively cooked (boiled) under official supervision and then passed as sound meat, while the evidently affected parts should be destroyed.

Such a course evidently renders these meats equally safe to that of the healthiest animal, or perhaps even more so, for we cannot at all time discern what insidious disease be lurking unseen in an apparently healthy body.

We have refrained from dwelling on all the phases of the subject of meat inspection as suggested in Dr. Schwartzkopff's excellent paper of a year ago because time would not permit, but have confined our consideration mainly to those questions which seemed to us most in dispute and which would, in our belief, lead to the most spirited and profitable discussion. Respectfully submitted.

W. S. WILLIAMS, *Chairman.*

The report was received for discussion.

The President. We will now have the Secretary's report.

The Secretary read his report as follows :

SECRETARY'S REPORT.

Mr. President and Gentlemen:

The past year has been a very busy one in Association circles and I trust that much of the work done may be found here to-day, in the evidence of numbers and interest shown in this meeting. Hundreds of letters of inquiry have poured into my office and at the close of my work on Monday morning, not one remained unanswered or unrecognized. We gather together to-day with a new element among us in the delegates from no less than ten State and local associations, while our members are numbered among the most active in every association circle in the land. Our association numbers to-day 270 members actively participating in our work, while in addition we have the support and encouragement of some seven in the roll of Honorary membership ; while to day some thirty more have knocked at your door for admission. Surely these are propitious times and signs of healthy growth. During my incumbency as your Secretary, in round numbers one hundred and fifty new members of the profession have sought your favorable consideration. Should this ratio of increase continue during the balance of ten years from 1888 to 1898, your membership will in all probability, reach 1,000, in our country. Much of this newly added power comes from the youth and strength of the future profession of your wonderful country and it places upon the shoulders of those trained in the service a deep responsibility in guiding this great power and moulding its untold strength, in lines and ways of great use, for the up-building of your veterinary structure in America. On every side in State and county and city, are budding forth associations of veterinarians, all training their guns upon this parent association ; looking for the word of command to so direct the powers of their ammunition, in telling directions where it may not be spent on vacant space and so lost forever in the din and smoke that follow in its train. Upon us falls the grave responsibilities of centering our

greatest forces upon all questions of a national character, that the more local work should devolve in its chief detail upon the lesser organizations were time and position fit it better to rest and be performed.

In national sanitary work ; in national meat inspection ; in national laws as to contagious and infectious diseases ; the commercial interests of our nation at home and abroad command our salutary support and influence in sustaining our place among the nations of the world, as the great producer of food and food products for the whole earth, national and state laws to better protect our people from disease direct and indirect, should be yearly considered by this association. Sanitation in its wide and inestimable importance should receive at our hands a broad consideration, that public sentiment might better be moulded to yield to our profession, its chief place as sanitarians in all this work the world over. National ethics of which I hear whispering sounds down along the line of our members, should here be given an impetus, that shall award it, its proper status in country, state and city. Veterinary jurisprudence in the hope of better and more justly uniform laws is before you to-day, and I trust it may sound the alarm down along the ranks, that shall carry sufficient force to return to us again in a clearing away of the debris of useless and worthless decisions, that make up the laws to-day that govern the decision of these important points to us, and thus free us from the injustice we suffer and remove us from the unfair criticism, that often make us the laughing stock of our ignorant employers.

Our country so rapidly assuming a first place among the nations as a producer of the finest specimens of every form and kind of domestic animals, should command our attention in enlightening the world on breeding statistics and the relative part thus played in disease, heredity, etc., etc., should be a self assumed task upon our part. In addition our association should be doing some work looking to the avoidance of the importation of diseases heretofore unknown in our breeding districts, and taking fitting recognition in the future of such out-breaks at the fatal one of "Dourine" in Illinois.

Surely, the older nations of the earth are looking to this youthful, unrestrained but always practical nation, to play a more important part in veterinary annals in the world's work in the future, than we have done in the past. From this organization should emerge the plans and directing forces and I hope we shall not be unmindful to-day of the opportunities that are within our grasp. The world's fair but two years hence offers a fitting opportunity for us to step forward into line with all the older veterinary worlds end, I trust this association will take proper and active steps looking to an International meeting at Chicago in 1893. We should be early in the field with our announcements and thus have all future gatherings of veterinarians planning in union their work that it may better fit in to the work for us to do in 1893.

Sources of veterinary education in our land should ever be watched by us with a zealous eye, and we should be quick to respond in just recognition to every movement upon the part of veterinary educational institutions to increase their power and to broaden their course of instruction. We cannot control our schools, but we can do that which is better in a nation living under a republican form of government, we can mould and fashion

public opinion throughout our land, that shall justly measure to each educational source its value and worth and thus strengthen our own place in national work, that shall make us a more useful body in the future, than we have so filled as an ornamental and obstructive body in the past.

These are a few of the thoughts suggesting themselves to me since I have filled your office as secretary, and I take the liberty of incorporating them in my report.

During the past year our association has been represented in every veterinary gathering held in our country, through the faithful support and assistance of our Assistant State Secretaries, by my presence as your representative, or by letter in your behalf. I have given aid and encouraging support in every meeting of veterinarians and urged their union with us in carrying forward the work that is ours to do. Through public press and veterinary journals I have endeavored to strengthen our organization in every way that I could; keeping before them at all times something of interest to awaken them to a keener sense of duty. Through printed matter the output of your publication committee, I have placed in every nook and corner of our broad land some seed to germinate, that I hope in the future will flower to shed fragrance on this body.

I have compiled for your use a list of veterinarians now numbering 1,300, spread over the entire country, their correct addresses and of what colleges they are graduates. I have almost completed a complete file of every member of this organization since its birth, and only the lack of records so imperfectly kept has forbidden me to trace in completion their entire history as a part of the record of this association. As books of reference for future officers of this association, these books are invaluable. The sending forth of at least three statements of their respective indebtedness to the association of each member, has been a valuable reminder to all, and your increased treasury with a ten-fold multiplication of our expenses, attests the value and efficacy of this work.

No member henceforth can be one of our number without a proper record, being on file, showing his qualifications, etc., neither can he be in possession of our certificate of membership, without their being on file in sustaining his claim, his signature to our Constitution and by-laws, a copy of which has been placed in every member's hands, and one to each new one with his application blank.

For this meeting some nine hundred programs, railroad notices, etc., etc., have been sent out, and at this writing less than ten have been returned undelivered. The newspaper press has been in many ways notified of our existence and no opportunity has been lost to bring our organization into that just prominence she so richly deserves.

All this and much more has been performed in your interest and welfare and it has been at a fearful expenditure of time and labor.

The pecuniary compensation is wholly inadequate to assure you of the continuance of this work, unless our good fortune shall drop on one of you whose heart will grow rapt up in the work, as I have and found my mind continually planning. I would, therefore, recommend the consideration of an increased salary as a stimulus to this work and with the hope that some one will after to-day take up and make grander and better the work already

done and thanking you all for your warm support and encouragement, I give you notice at this time, that there are no contingencies or train of circumstances that can lead me to accept this onerous position again. I therefore submit for your consideration my final report.

W. HORACE HOSKINS, *Secretary*.

The Secretary. My accounts are here for your examination and approval. I beg to say that letters of regret have been received from Prof. McEachran, Prof. Liautard, Drs. Rouif, John S. Meyer, Hunter, Nesbitt, Grange, Morris, Howard, and Schwartzkopff.

The President. The next order of business is the report of State Secretaries. Several state secretaries since morning have been dropped from the association. Therefore, California is not represented. There is no representative from Kentucky. Dr. Cary, of South Dakota, is not present. Dr. Walmer, is present, I believe. *Dr. Walmer.* I have no report to submit. *The President.* Georgia has no representative, having also been dropped. The Secretary will read the report of Dr. Grange, of Michigan. The Secretary read the report.

No report was received from South Carolina, but the assistant state Secretary Dr. B. McInnes, had forwarded three photographs, one of which was a young calf of a few days old suffering from tetanus. It was a very striking picture. The others were of bitches suffering from tetanus, the sequel of the operation of ovariectomy.

The President. The next state represented here is that of Maryland—Dr. Clement. *Dr. Clement.* I have not prepared a report, and therefore have none to offer. *The President.* The next state Secretary is Dr. Lowe, of New Jersey, Dr. Lowe submitted a report:

We have a communication from Dr. Frinck, of New Brunswick. The Secretary read the communication.

The President. The report from the College Committee which was postponed in the order of reaching it will now be received.

Dr. Lyford. I have letters here from four or five Colleges. The different Colleges to which I put the list of questions were the American, New York, Ames, Kansas City, Montreal, University of Minnesota, Chicago, Toronto, Pennsylvania and Harvard. Four answers have come. Why we should not have

gotten answers from the nearest colleges to me I do not know. The communications from the New York and Toronto Schools were the first to appear, although they were the farthest off. The questions I put to them for answer were first: What would you consider the necessary requirements for standard uniform Veterinary education? Second: What would you be willing to do in the matter to obtain such a standard? The letters were read as follows:

The Iowa School's report was that they were willing to do anything to increase their course, and would do what they could if it was in accordance with the rest of the schools. The State University of Minnesota has a three years course of nine months each. They are just starting in, and they are now building a large hospital. That is one of the reasons why Prof. Schwartzopff is not here.

The President. The first report for discussion before the meeting is that of Dr. Peters on Intelligence and Education. The Chair would suggest that in order to expedite and facilitate and make the discussion of these reports more clear, and to avoid the annoying conversation which we sometimes have, of short questions being answered and perhaps useless questions being asked at times, that each member be allowed a time not exceeding ten minutes for a single discussion. Of course if anything is to be added of special nature the privilege can be accorded. Is there any objection to that mode of discussion. *Dr. Miller.* I move that the discussion be limited to ten minutes and one final response by the writer. The question was put, and the motion agreed to.

Dr. Clement. Mr. President, and Gentlemen, I was very much pleased to hear the report of my friend Dr. Peters this morning. and I must say that I am very much impressed with the fearlessness with which he expresses his opinion. I think we should all follow his example at our meetings. I wish to speak only for a moment upon that part of his report which refers to investigations of swine fever and hog-cholera. I wish to say a few words simply because it has been my opportunity for the last three or four years of doing some work in that line myself in association with Prof. Welch at the Johns Hopkins University. I might say in parenthesis that my work in this line has nothing whatever to do with my position as Government Inspector. That it is independent work performed in the laboratory of the above

institution. The conclusions which we have arrived at, expressed in a few words, are these, and I must be careful in mentioning them that I do not anticipate what is to come out in the report winter, namely: that there are two diseases of swine in this country. First there is a hog-cholera, and secondly swine-plague. That the two diseases which occur in hogs of this country are described in the reports of Dr. Smith of the Bureau of Animal Industry; that the organism described by Dr. Billings as swine-plague and that described by Dr. Salmon as hog-cholera are identical. That swine-plague does exist and does cause more or less trouble, is in our opinion without a doubt. As to what connection the organism has with the lesions described in the reports of the Bureau is a question on which we might not all agree. Nevertheless the swine-plague organism does cause trouble. The trouble in hogs is as a rule, in our experience, one of mixed infection. We have not had the opportunity of seeing an outbreak of swine-plague pure and simple. The remarks which Dr. Peters quotes from Dr. Jeffries' experiments it seems to me are not altogether in keeping with the work which is being done at present.

The conclusions which Dr. Jeffries draws are that there is but one disease of hogs, according to the investigations made at that time. We have found that it is very hard to say when swine-plague is present that hog-cholera is absent, from the fact that swine-plague kills in a few hours, while hog-cholera requires some days. If, then, an animal be killed and presents lesions of the intestines such as are generally supposed to be characteristic of hog-cholera the statement must be very carefully considered before it is made, that hog-cholera is not present. We are thrown off our track once or twice during the earlier part of our investigation. We found afterward that hog-cholera did exist in these animals that we thought had swine-plague pure and simple. We found that some of the colonies were different from others and required cultivation and inoculation into animals and produced cholera even if the inoculation from the sick to the well animal and the characteristics of hog-cholera absent kill the animal. I would simply say in general way that from our investigation we have found that Dr. Billings is right in certain other matters.

As to the identity of the American swine-plague with the German swine-plague I am not at liberty to speak at this moment on account of the absence of my Senior associate in the work.

I cannot say too much either, as I said before, because the report will be forthcoming in the course of a few months at most, and I think it will then be found as fair a report as the investigators in the matter are capable of producing, and as said above that all the parties interested in this long continued discussion are right in certain directions.

Dr. Kilborne. I wish to answer one point in Dr. Peters remarks this morning, and that is in regard to the credit due for the investigations of hog-cholera. It is insinuated in that report that whereas Dr. Salmon has been receiving the credit for the work has been done, it turns out now that Dr. Smith has been doing that work all along. That, in one sense, is true, but I have been connected with the Bureau for the last five years in its work, and the investigations in swine disease until the past year has been under the immediate supervision and direction of Dr. Salmon himself. The microscopic work is in charge of Dr. Smith, and the field experiments I have had charge of. If any one will take the trouble to read the report of the Bureau of Animal Industry they will find in every one of the reports that it is distinctly stated in the preface or letter of transmittal that Dr. Smith has had charge of the laboratory and I have had charge of the experiment station. Any one who will look at that can easily conclude the assistants who had done the work, and I do not see how they can accuse the chief of the Bureau of playing double in that matter. The work has been directed by him, the experiments were directed by him, and he had reported the result.

Dr. Clement. Can we speak twice on the same question?

The President, There is no objection.

Dr. Clement. I wish to quote a short paragraph from Dr. Jeffries' article in THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES, December 1890:

"One dead, full grown hog was sent to me for bacteriological examination. Unfortunately decomposition was well under way before it came to hand. Autopsy made by Dr. Peters and myself shows skin red and blue in patches and studded with ecchymoses, especially on the ventral surface. Lungs dark red to purple, resistant but not so solid as in lobar pneumonia; cut surface moist bloody fluid, with few bubbles oozing out on pressure; bloody pleural and pericardial effusions; plurae, pericar-

dium and peritoneum cloudy and studded with small hemorrhages; spleen enlarged, emphysematous, putrid; liver congested; kidneys with hemorrhagic blebs up to the size of a small beechnut scattered over the surface; intestines much decomposed, so that the presence of ulcerations cannot be affirmed."

Even there he admits the possibility of the so-called ulcerations of the intestines, which is the generally accepted characteristic lesion of hog cholera, and which in my opinion is diagnostic of hog-cholera. In a second animal he admits the presence of ulcerations in the intestines, but at the same time says, in conclusion, "the two epidemics studied by me were due to a small bi-polar germ identical with sample of swine plague received from Washington and culture of Loeffler's germ from Schutz, per Billings. No hog-cholera or swine-plague bacilli occurred. No characteristic lesions have been observed, the pathology pointing to a general infection tending to chiefly affect the lungs and intestines." It seems to me very evident, that these animals were affected beyond all possibility of a doubt with hog-cholera as well as with swine-plague, which the author of this volume claims was the sole cause of death. I do not think he could prove that hog-cholera was not present, unless he examined carefully the several colonies in the Esmarch tubes or plate cultures from each organ, in that way demonstrating the absence of the cholera germ.

I simply say this not as against the work here quoted, because it is such a very good contribution, but as simply showing the difficulty surrounding the investigation of these complicated diseases of swine. It is by no means an easy task as demonstrated by the literature upon the subject.

The Secretary. Mr. President, I do not care to switch off from the hog subject, but Dr. Peters this morning in his admirable report touched upon the standards of the various Veterinary schools in the country. I think that the suggestions outlined, that this body, being the leading body should demand for its membership the highest and broadest curriculum and the highest and broadest qualifications of individual members is no longer a question for us to decide. I think the multiplication of our membership as rapidly as it is multiplying is the best evidence of it, and the question is as to whether we are as an association leading the profession in this country. It looks rather that we are willing to follow whatever a school or organization may lead. Certainly we are all imbued with the fact that no one can be

learned in the breadth and scope of Veterinary medicine and Veterinary science in less than three years course of six months each devoted entirely to the subject of Veterinary science and no collateral branches. (Applause).

Then it becomes prudent at this moment for this association not through her Comitia Minora, which has seen the failure of members for years, but it becomes better, that this association as a body shall take steps at this meeting to make that a compulsory part of the qualification of the future members of this association, and perhaps no year father away than 1892 for us to adopt it. The multiplication of schools and Veterinary chairs in Agricultural colleges is fraught with the greatest dangers to the Veterinary profession of America, and perhaps has retarded us more and kept us in the the position we occupy in the Veterinary world than any other one thing. This association should no longer look to what should be the qualification of a member in a state or local association, but high and above it all should place its own qualifications, regardless or any other organization, on the plane that Dr. Peters has pointed out so clearly. I should like to see a resolution incorporating a suggestion that three years course of not less than six months each shall be devoted entirely to the study of Veterinary science and be one of the necessary qualifications for admission to this association in 1892. (Applause).

Dr. McLean. The Comitia Minora were almost a unanimous body for the recommendation for adoption by this association of the very features that have been so carefully laid before it by Dr. Peters in his report. To carry that into effect it would be necessary at the same time to give notice of an alteration of your By-Laws. The By-Laws itself calls for certain requirements and those provisions would have to be annulled in order to put in force the suggestion which has been thrown out by Dr. Peters and Dr. Hoskins. As I said before the Comitia Minora and that was whether it would not be advisable to accept in lieu of one course of six months the certificate of a year's pupilage under a practitioner of our profession. In many schools theory is carried to an extreme point where the practical is very much neglected.

Theory and practice must go hand in hand, and we know that in many cases practical knowledge is only obtained at the expense of the owner of the patient after the pupil has left the school.

Dr. Michener. I do not think we are likely to come to any

agreement on the subject. There are certainly a few among our Veterinary schools, which, while they claim their willingness to make the course three years, have no idea of doing so. I doubt if they ever will do it, notwithstanding their expressions of willingness, and I think we had better be careful in introducing anything of this kind in our Constitution. I scarcely believe that any of those now operating under a two years course will change it. They say they will do it, but they do not do it. What I think really ought to be done in this matter, and I think our Constitution allows it, is to examine any applicant whether he be a graduate or not before we elect him as a member of this association. Examine him no matter from what college he may come so that we may be sure his requirements meet our ideas of what they should be. I urge upon the Society the necessity of doing this. We could thus get men who would do us some credit. We should insist in all instances on an examination. Some schools with a three year's course turn out men who are less fit to practice the Veterinary profession than some colleges having only a two year's course. Two years of course is to brief a period to study a profession like this. We are or should be studying the profession as long as we live. We only achieve in the short time devoted to the college course the right to possess a diploma. It is after that that we get the real knowledge we possess. I would urge that in future these examinations be insisted upon in a vast majority if not in all cases rather than change the Constitution and By-Laws.

Dr. Lyford. We have worked along with little results from the colleges. It is high time that we take another step, and I think that we can take this in advance of the colleges, and they certainly need some prompters. We have asked them various questions and they evade the answers. They tell us that they will do certain things, as Mr. Michener said, and they never come to time. The large proportion of them that have two years course admit that they would be glad to make the course three years. If we can in any way compel or stimulate and induce them to make a three year's course, we have started in advance in a way that will promote the quickest results. It is hardly expected that the professors of the different colleges will get together and agree upon a course, and I think if they see that the standard required by the profession and the U. S. Veterinary Medical Association is a three year's course it will not be long until those now requiring a two year's course, or a practical course of one year and six months or lesss will soon make a three year's course necessary.

It is not the college, it is the brains that go into the schools. It is the men that make the students, and if we get good students from a two year's course college it is very poor judgment to think that the same good students would not excel in a three year's course college. I do not think Mr. Michener considers that the same student in two years can equal the student for a three year's course, and I think it is a poor argument to advise the continuing of the two year's course if we can in any way remedy it and induce or promote the three year's course principle, and prevail upon the different colleges to come to that standard.

There is another thing. The curriculum of some of these colleges do not require the same amount of studies as others. I think the Comitia Minora will also play a part in this result. When it is brought up, I think we ought to make it strong enough to cover the ground for Agricultural schools and compel them to take an active part as those making a profession of it.

Dr. Winchester. Several years ago there was a By-Law that members should pass an examination in order to become members of this association, if they did not possess a diploma of some school. That sounds first rate. I had the misfortune to be by proxy at one time an examiner of some gentlemen who were proposed for membership. That examination was a farce. It was over in less time than it takes to tell about it, and the parties were duly accepted as honored members of this body, which undoubtedly they have proved themselves to be by their actions. Now, in order to make an examination necessary for admission to this society and have it straight, and have your examiners chosen from this society, if it is any sort of an examination it will take a week at least, and how many members are there here who will give up one week's practice and come and sit in a hall and keep those fellows from niggling to pass their examination to become members of this association.

The Secretary. We had at Chicago some ninety applications for membership, and we did not get through until after two o'clock in the afternoon, and instead of convening at ten in the morning, we did not meet until half-past two in the afternoon. The question of an extended course of instruction of three years' of not less than six months each is to guard against the establishment of a Veterinary chair in which a Veterinary department is in connection with the Agricultural school. They all have their course of three years of six, eight, or nine months each, and at

the same time two-thirds of that period is applied to branches that do not directly pertain to veterinary science, and the entire course of instruction, as has been well said by Dr. Peters this morning, is invariably the result of one man's work, perhaps assisted by two or three of his own production. Surely that is not right, and surely as a man coming simply with a diploma of that type should not be considered qualified to be a member of the United States Veterinary Medical Association. (Applause).

Dr. McLean. I would like Dr. Michener to understand that in the remarks I make I do not pretend that the United States Veterinary Association is legislating for the colleges, but that they were simply establishing a stand point to be strictly carried out as to the qualifications necessary to be a member of our Association. Let the colleges follow or let them stay out.

Dr. Clement. It seems to me that an institution having but two or three professors in a special line may possibly be as good as an institution which turns out men in one very short session ; where the principle is that it makes no matter who comes in and it is only a question of numbers, and not quality. It seems to me that the one man institution is certainly as preferable as the short course institution. But I am quite in accord with his remarks if a resolution should be passed stipulating the length of a course and the number of professors. If the length of course be stipulated so should be the number of teachers. It seems to me we are going a little beyond our limit. This is a cosmopolitan association, and the question is whether it does not represent the association as it stands, not as we wish it ought to be.

Dr. Martinet. Does not this discussion pertain more to the report of Dr. Lyford? It does not pertain to Dr. Peters' paper.

The President. Is there any further discussion on Dr. Peters' report ; otherwise Dr. Peters has the floor in response.

Dr. Peters. All I will say about my paper is, that I considered everything I had to say very carefully before I said it, and there is nothing in it but what will hold water, and nothing that I will take back. (Laughter and applause).

The President. Then we come to the discussion of the paper on diseases. If there is no discussion on that, we will pass to the next paper, which is that coming from the Special College Committee.

Dr. Martinet. I think the matter was so ably discussed in paper that we are not able to say much about it.

The Report of Special Committee of Food Inspection was next discussed.

The Secretary. Inasmuch as there seems to be an absence of those who have been paying special attention to the subject of that report, that it would be well to receive the report, tender a vote of thanks to the committee, discharge the committee and allow the matter to lay over for discussion in 1892. In the meantime we shall have an opportunity of reading and studying the matter, and then certainly we would be better able to understand the discussion that might take place between those who have made this work a subject of study.

The suggestion of the Secretary was adopted.

The President. The next paper is that submitted by Dr. Miller.

The Secretary. I will here give notice that to-morrow I shall introduce in writing for the consideration of the association, that it may be brought to a direct vote, a resolution as to whether we shall not raise the qualifications for entrance into this association.

The President. We now have before us the report of the Committee on Army Legislation. You heard Dr. Miller's Report.

Dr. McLean. I move that the report of the Committee on Army Legislation be received and the Committee discharged.

The Secretary. After all the work that has been done in the matter to discharge that Committee! I think not.

Dr. Miller. My recommendation was that a new bill should be framed, or amendments offered to the old one, in order that the work be continued, but I hope and pray that somebody else will be put in charge of its continuation.

Dr. Faville. I move that the report be received and that the Committee continue.

Dr. McLean. I ask whether it is not a fact that all Committees are re-appointed annually by the incoming President?

Dr. Miller. I move that the report be received and adopted.

Dr. McLean. The report has already been received, but I want it adopted because in doing that we adopt the recommendation of Dr. Miller.

A new Committee will be appointed and a fresh bill drawn up to meet the objections of the present one.

The President. The present Committee is in existence until a new Committee is appointed.

Dr. McLean. My motion is to adopt the report of the Committee and that the Committee be discharged with thanks.

Dr. Miller. I might say a word in relation to the work that I was not able to state in the report. As I just stated to Dr. Michener, in the three visits I made to Washington I worked diligently upon the subject. I also corresponded with almost every Senator and Member of Congress whose name and address I could obtain I wish to say also that you have no idea of the amount of labor and time that is necessary to bulldoze—as you might term it—a bill of that kind through Congress in the face of the objections that have been urged against his passage, and some of them very plausible ones. Some of these objections are in letters received from men who have been in the service ten or a dozen years. It does some pretty hard, even if they are not graduates, after they have given their time and services that they should be summarily dropped. If they have been capable of serving the Government all this time, and the Government has received their services, it seems rather a hardship that they should be thrown aside and others put in their places. All they ask is very reasonable. As written in their letters, they asked that they be retired with certain pay. There is one cause of dissatisfaction that we would not have to contend with it it were taken out of the proposed bill. It is hard to put a bill through Congress that is so unfavorable in the eyes of members as this bill is.

As I stated in my report there is a decided objection on the part of Congress to increasing the commissioned officers of the Army. They say that the Army is too large already, and as these men have done the work heretofore and the Government has gotten along very well with them they do not see the necessity of passing the Bill. That is one of the points brought against it, and when you appear before the Military Committee they have such powerful arguments against the increase of commissioned officers that they make you feel at sea.

I did all in my power to increase the Veterinary force of the Cavalry service. Members of Congress say that they are cutting down the number of medical officers of the army. I think however if the amendments I recommend are made to the old bill that with the united effort of Veterinarians with their Congressmen at home, we can go to the next Congress and get the Bill through without very much legislative work, and it was for that reason I made the recommendations referred to. After having gone all over the ground and given the matter careful thought, I believe from conversations that I have had with members of Congress we could push the matter through.

The President vacated the chair, the Vice-President presiding.

The President. I was sorry while in the chair not to see any one take up this question of Army Legislation, because I think it is a very important subject, not only to the community but to ourselves, to this association and to the standard of the Veterinary profession. I have had a good deal of experience, having been Chairman of that Committee for the year preceding the last year, and am thoroughly cognizant with the difficulties which Dr. Miller has mentioned to you, and which I did not mention in my report a year ago as Chairman of that Committee for the reason that at that time the Bill was in such a position I did not care to use names personally, but which I will do now without hesitation.

It is certainly an outrage that the animals of the United States Army are the only animals in the world that have not authorized official Veterinary protection. Even the Government of Guatemala, a small Republic, has a Veterinary Corps to look after the animals belonging to the Government. There is not a civilized Government, but our own that does not employ a Veterinary Corps. You know the position that a Veterinarian occupies in our Army to day. It was a bone of contention a year or two ago. I could give you the case of a Veterinarian who was sent by the Quartermasters Department of the Army to the West. The letter is on file in the Surgeon General's office to-day, and I have read it. He was in St. Louis five months under pay, reported to the Quartermaster's Department daily, and he did actually nothing. He was sent into the Kentucky to report to a Board for the purchase of horses, where the *Inspector*, who had a great deal of personal ability, looked over and bought a number of horses. The Veterinarian was a thoroughly competent man and former member of this association, now dead. He was not allowed to express an opinion on the animals purchased. They were sent to one of the Cavalry companies and five of the horses the Captain refused to accept, as not fit for the purpose which they were purchased.

The men employed in the army are, some of them, members of this association, and there are some decent reputable men among them that we are glad to have. There are others that you would not employ in your infirmary, and it is among that class that we meet the greatest opposition in the matter of legislation. It is these particular individuals whom officers in the army do not want to receive a commission. I knew all this a year ago, but did not mention it. If those individuals who happen to hear my

remarks wish to apply them to themselves, all the correspondence is at the disposal of the association. There are about 150 letters from these men to myself and to each other and letters that have passed two or three hands with endorsements before they reached me, on file and if parties wish to apply to themselves what I am saying they can have the benefit of reading the letters.

Now that is the position of the opposition. It does not apply to these men as a class, but to individuals among them, and it is from that little group that the principal opposition comes. It is going to be slow work for the reasons Dr. Miller has given you. There is a large number of commissioned officers in our army compared with other armies and the disposition of Congress at present is to reduce the number. If we suddenly had a war it would be very easy to get a Veterinary service and have it put upon a good standard. If war was declared suddenly the Government would probably give us fair rank, but we hope of course that there will not be such an event as war. In the meantime we hope to attain our aims and can only work towards them slowly. If it never got beyond the Military Committee every Congress we should have a Bill pending that we think we can have passed and get it endorsed by the head of the army. Certainly a Committee should be kept in this association that will always be acting on the matter or Army legislation and be in a position to take advantage of the first opportunity of establishing a proper service. (Applause.) The President resumed the chair.

The question was put and was received.

The President. The next report for discussion is that of the publication Committee.

Dr. Martinet. I move the report be accepted with thanks. The motion was agreed to.

The Secretary. There is one suggestion I made that some notice should be taken of, and that is the publication of the proceedings of the association. Whether it should be still left with me to make some arrangement with one of the journals for reprints or other arrangements be made. It is a question that ought to be considered under the head of the Publication Committee Report.

Dr. Winchester. I move that this association enter into a contract with the publishers of the *American Veterinary Review* to publish the full proceedings of this meeting. That we make some contract price with them on account of the interest they

took last year in our deliberations and the publishing of our proceedings gratis.

Dr. Williams. I am opposed to any such arrangement. We cannot afford to show any favoritism between the two American Veterinary journals, and I move that the *Comitia Minora* be instructed to have the proceedings and papers of this association printed and distributed to members. Those taking an active part in these meetings should have a few extra copies. How many copies are needed?

The Secretary. We had three hundred and fifty copies from the Review, and I submitted to the Review a list of all our members. These three hundred and fifty copies, with the exception of thirty or forty, have disappeared from my shelves.

Dr. McLean. There are only two journals in the United States devoted to our profession, and I do not think we should make any invidious distinction. They will both publish the proceedings in full and we should divide our patronage by getting three hundred copies from one and three hundred copies from the other.

Dr. Martinet. I think the best way would be to purchase a certain number of copies from each of these publications, as suggested by Dr. McLean.

Dr. Miller. I agree with Dr. McLean that we should make no invidious distinctions. I think the editorial staff of one journal is just as much interested in us as the staff of the other journal, and one has done as much for the advancement of our interests the other. I therefore second the motions made by Dr. McLean.

The President. If you will allow me a suggestion, I will say that if the association wishes to assume the expense of publication, why not do it on business principles, and ascertain where they could get the number of copies they desire at the cheapest rate.

The Secretary. The expense of the Stenographer's Bill at Chicago was divided, and my trouble was to furnish to each one of them the manuscript so that they could get their journal out at the same time with the same report. One paper was setting up the type while the other did not have the copy. I felt as much interest in one journal as in the other, and the thing became a source of trouble. We always allow fifteen or sixteen days to get the matter up in type, which is a short period.

Dr. McLean. I renew my motion that this association purchase three hundred copies each from the *Journal* and the *Review* of the entire proceedings of this association as printed in those publications.

Dr. Winchester. Where are you going to buy them? *Dr. McLean.* From the publishers.

Dr. Clement. Are we to give these away to those who should subscribe to the journal, but who do not do so? *The Secretary.* I have always taken advantage of the opportunity to send to the young men all our reports gratis.

Dr. Berns. Last year was the first time that our reports were formulated in anything like proper shape. Heretofore we simply had a synopsis of our proceedings. The entire proceedings from beginning to end were duly recorded at the last meeting. It seems to me that simply a synopsis, which is all we could expect from either of the journals, is hardly sufficient for our purposes. As long as we have a stenographer here a full report should be printed and paid for by the association independent of the journals. That would be the correct thing.

Dr. Williams. The proper thing is to have an entirely independent report of the proceedings of this association that every member of this association may have a copy, and then the editors of these journals can make extracts and such comments as they see fit. It seems to me that is in every way the better plan. I, however, take the *Review* and the *JOURNAL*, and would not be without them. I prefer to have the comments of the *Review* and *JOURNAL*, and then have a special copy that I could put upon my shelf as the report of this meeting of 1891.

Dr. Clement. I move as an amendment to the motion of Dr. McLean that the publication committee of this association be authorized to have printed five hundred copies of the proceedings of this association for distribution among the members without regard to either the *JOURNAL* or *Review*. In other words to have the printing done where it can be had cheapest. *Dr. Peters.* I would suggest as a substitute that the association allow the journal offering the lowest bid the privilege of publishing the proceedings of the association. *Dr. Miller.* If Dr. Clement will offer his amendment as a substitute I will accept and vote for it. *Dr. McLean.* Can you give us any idea of what the cost will be. *The President.* If you base it upon the proceedings of last year, I

assume that the cost of printing the proceedings will amount to a little more. If the association had undertaken to publish the proceedings itself last year the cost would have been about \$170 after they got the copy. I mean that is the cost not including the first expense.

Dr. Clement. Cannot the publication committee have this printed by one of the journals. The journals are not disbarred. I simply mean for the publication committee to have it done wherever they could have the work done cheapest without regard to any particular journal. *The President.* Exactly, the cheaper it is done, the better for the association.

Dr. Miller. And then it does not appear on the minutes that we draw an invidious difference between one journal and then the other, let the committee get the work done where they can get it done cheapest. The question was put on Dr. Clement's motion and it was agreed to.

The President. You have now before you the matter of the Special Committee on Central Organized Body, which made no report.

Dr. Winchester. That committee has been in existence, if I remember rightly, four years. There never has been a report from it. It has never been demonstrated to this society what the standing of that committee was. I, therefore, move that the committee be discharged and not another one appointed. *The President.* It is a special committee, and if discharged it would require special action in order to appoint another. The question was put and the motion of Dr. Winchester was agreed to.

The President. Is there any discussion on the report of the Special Committee on food inspection? *The Secretary.* That goes over to the next meeting for discussion I believe. *The President.* You now have before you the Secretary's report. *Dr. Winchester.* I move that it be accepted, except as to the last clause. (Laughter and applause). The motion was agreed to.

The President. Have you any action to take on the reports of the Assistant Secretaries? *Dr. Miller.* I move that they all be accepted and filled. *Dr. McLean.* Coupled with a vote of thanks. The motion as amended was agreed to.

The President. The next order of business is the election of the officers, which concludes the business for the day. To-mor-

row being set aside for the reading of papers. *Dr. Winchester.* I nominate for President, Dr. J. H. Stickney, of Boston. *Dr. McLean,* I second the nomination. *Dr. Miller.* I nominate Dr. R. S. Huidekoper for re-election. *Dr. Kuehne.* I second the nomination. *Dr. Clement.* I nominate Dr. Williams. *Dr. Berns.* I second the nomination. *Dr. Kilborne.* I nominate Dr. Michener. *Dr. Lowe.* I second the nomination. *The President.* I have decided not to be a candidate, and you have before you the three names of Drs. Stickney, Williams and Michener.

Dr. Michener. To make matters a little easier I withdraw my name, thanking you gentlemen for the honor. I could not possibly attend the duties of the office. I respectfully decline the honor.

Dr. Miller. Before we go into the election of officers, I want to rise to a question of privilege. I would like to know whether or not in the absence of a member of this association, such absent member can be nominated for the office of president and elected?

The President. There is certainly no regulation against it.

Dr. Miller. It seems to me to be a very unwise thing to do. I have nothing against Dr. Stickney, and if here, I would vote for him, but I think if a man has not enough interest in this association to attend its meetings he ought not to be put up by his friends for president of the association. I have the highest regard for him as a man, and would vote for him if he were here. (Applause.)

Dr. Winchester. I nominated Dr. Stickney knowing that he was not here, but if the gentleman will look over the records I think he will find that since the birth of this association he has attended the meetings as regularly as any member of the association. Because he is not here to-day, I do not think it disqualifies him. As a member of the association he has done more than any one else to sustain the work of the profession. He has taken the position that our friend Hoskins always has taken as regards the education of a man to be a veterinary surgeon, and he has been to us down in Massachusetts a pretty good guide.

Dr. Miller. I grant all that has been stated by Dr. Winchester. No man in the profession has a higher regard for Dr. Stickney than I. My question was simply asked as to the precedent. I do not think it is the province of this association to elect a man to the office of president of the association who is not

present at the meeting. I did it upon what I considered constitutional grounds. There is not a man in the profession to-day, not even Dr. Winchester himself who has more respect for Dr. Stickney than I have, but as he is not here I cannot vote for him. I do not think we should elect him in his absence.

The Secretary. There is no member of the association that it would give me more pleasure to vote for than Dr. Stickney, but Dr. Stickney for the last few years, because of infirmity of some kind, has not been able to mingle much with us, and we are now approaching an international meeting in 1893, and it is of the utmost importance at this time to elect as president a man that will lead this association up to all the necessary qualifications for that meeting. I think it requires one who has been very closely identified with all the work that has been specially done during the last four or five years, and who has not only mingled with us, but who has been active on committee work and been associated with the Comitia Minora, therefore I trust that our present presiding officer will not withdraw his name under the circumstances. (Applause.)

The President. Gentlemen, nominations are still in order.

Dr. Winchester. Under those circumstances, I most respectfully withdraw the name of Dr. J. H. Stickney.

Dr. McLean. I second with deep regret, feeling that the association has expressed the sentiment concurred in by the mover of his nomination, and I withdraw my second.

Dr. Berns. Then the only candidate for the time being, as I understand, is Dr. Williams. *Dr. Winchester.* Dr. Huidekoper and Dr. Williams. *Dr. McLean.* I move that the nominations be closed. The motion was agreed to. *The President.* I will appoint Dr. Winchester and Dr. Rayner as tellers. The tellers took their places and the result of the ballot was announced as follows: Dr. Huidekoper, twenty votes; Dr. Williams, six votes; Dr. Michener, two votes. The election of Dr. Huidekoper was made unanimous.

The President. Gentlemen, I am very thankful to you for this honor. I meant what I said when I declined to be a candidate for the office of president. The special reason given is the only reason that I allowed my name to be used, namely: that during this year the work to be done will be largely preparatory for the Chicago meeting, which we have decided to make inter-

national in character, and I know probably more veterinarians personally than many members of the association, I am willing to aid in the work.

Nominations for Vice-President are now in order.

Dr. Winchester. I nominate Dr. W. L. Williams. *Dr. McLean.* I second the nomination. *Dr. Martinet.* I move that the Secretary cast the ballot of the association for Vice-President and Secretary and Treasurer in favor of the incumbents. The motion was agreed to. *Dr. McLean.* Now I move that the Secretary cast the ballot of the association in favor of Dr. Williams for Vice-President. The motion was agreed to, and the Secretary cast the ballot as directed, and announced that Dr. W. L. Williams has been elected Vice-President. On motion, the Vice-President cast the ballot of the association for Dr. W. H. Hoskins as Secretary. *The Secretary.* I again ask that I be relieved of the position. (Cries of "No, No!")

Dr. Martinet. I move that the Secretary cast the ballot of the association for Dr. Robertson for Treasurer. The motion was agreed to, and the Secretary cast the ballot as directed, and announced that Dr. J. L. Robertson had been elected Treasurer.

Dr. Winchester. Under the head of new business, I wish to revert to the subject that was discussed to-day with regard to refunding to our friend, Dr. Hoskins, the discrepancy of last year's salary. I move that he be refunded fifty dollars.

The Secretary. I object to that. It certainly will not appear on the minutes that my asking you to enlarge the salary of the Secretary was a sincere thing, especially when you follow that up by making a donation which he has not asked. I still insist that I am not willing to serve again as Secretary, and think I have a right to be heard. I have served you three years, and that is as much as you ought to demand on of any one man. *Dr. Faust.* I think the demand is just and right, but I also think that to accede to the demand would be fatal to the society. *Dr. Miller.* I hope that the remarks of Dr. Hoskins will not be taken in the sense in which he has intimated. It is not that way. The President and myself know that the amount he received last year did not begin to pay his expenses in any way or shape. I know the hours that he has spent in correspondence. It has been almost impossible for me to get an audience with him at home for the reason that he was so busy with the duties of his office. It is not

that we want to give him back pay, but simply to reimburse him for expenditures that he has made on our account, and I hope the motion will prevail. The question was put, and the motion made by Dr. Winchester was agreed to.

Dr. Miller. I move that we do now adjourn to meet again to-morrow at ten o'clock. *Dr. McLean.* I second the motion.

The motion was agreed to, and accordingly, (at five o'clock and forty-five minutes p.m.) the meeting was adjourned.

Secretary's Statement for Year ending September 14th, 1891.

To annual appropriation for banquet and deficit.....	\$ 78 00
To rental Auditorium Hall.....	60 00
To L. McLean, expenses, Com. on Tuberculosis.....	18 00
To C. R. McKenzie, Dist. Pass. Agent, B. & O.....	28 70
To Secretary, salary, one year.....	100 00
To printing.....	32 25
To postage, stationery, expressage, etc., etc.....	74 51

Total expenses for year.....\$391 46

By collection of initiation fees and dues, Banquet fees, Two-third
expense of stenographers, Charges repaid by *Review* and
JOURNAL.....

Balance in Secretary's hands.....\$654 50
\$263 04

Signed, R. A. McLEAN,
THOS. B. RAYNER,
AUSTIN PETERS,
Finance Committee.

SEPTEMBER 16TH, 1891; 10 O'CLOCK, A. M.

Convention met pursuant to adjournment.

The Secretary called the roll with the following result: Members present: Drs. Barron, Berns, Bryden, A. H. Baker, S. S. Baker, Claris, Clement, Dougherty, Wm. Faust, Faville, Hinkley, Hitchcock, Hoskins, Huidekoper, Kuehne, Kilborne, Kidd, Lyford, Lowe, Martinet, Michener, Miller, R. A. McLean, F. W. McLellan, Peters, T. B. Rayner, Jas. B. Rayner, Jas. L. Robertson, A. K. Robertson, Swedburg, Thompson, Turner, Wende, Weber, Winchester, Waugh, W. L. Williams, Meisner, Knowles.

As delegates: Drs. J. C. Dustan, New Jersey; R. G. Webster, Pennsylvania.

As visitors: Drs. Isaiah Michener, Jno. W. Gadsden, N. Reutenwald, H. S. Hogsett, H. B. Rayner, A. M. Farmington, W. H.

Scrubey, W. Runge, Wm. Somerville, F. E. Parsons, C. B. Robinson, J. D. Robinson, Wm. B. Werntz, G. A. Jaman, I. N. Krowl.

The President. There is still some unfinished business to be transacted.

The Secretary. I have received a letter from Dr. Whitney with a check for his back dues, and I move that we rescind the action of the association yesterday in adopting the recommendation that he be dropped from the rolls, and further move that he be reinstated as a member of this association.

The motion was agreed to.

The President. The Secretary has another matter to submit.

The Secretary. I have to offer the following applications properly authenticated for honorary membership :

Applications for Membership, 1892.

HONORARY MEMBERSHIP: William H. Welch, M.D., Professor of Pathology, Johns-Hopkins University, engaged for the past four years in the investigation of infectious diseases of animals, especially of swine, endorsed by the members of the Maryland State Veterinary Society. Proposed by Dr. A. W. Clement and seconded by Dr. Rush S. Huidekoper.

FOR REGULAR MEMBERSHIP :

- Dr. I. N. Krowl, (Am. Vet. Coll.) Passaic, N. J.; Vouchers, F. F. Winchester, Austin Peters.
- Dr. William B. Werntz, (Vet. Dept., U. of Pa.), Philadelphia, Pa.; Vouchers, R. S. Huidekoper, S. E. Weber.
- Dr. A. M. Farrington, (Cornell Vet. Dept.), Washington, D. C.; Vouchers, Chas. B. Michener, William F. Howe.
- Dr. Fred W. Ashe, (Chicago), Chicago, Ill.; Vouchers, A. H. Baker, S. S. Baker.
- Dr. Theobald Smith, (Albany Med. Coll.), Washington, D. C.; Vouchers, Chas. B. Michener, W. L. Williams.
- Dr. F. K. Choffee, (Chicago), Chicago, Ill.; Vouchers, A. H. Baker, S. S. Baker.
- Dr. H. W. Hawley, (Chicago), Chicago, Ill.; Vouchers, A. H. Baker, S. S. Baker.
- Dr. G. Allen Jaman, (Am. Vet. Coll.), Chestertown, Md.; Vouchers, A. J. Thompson, J. A. Kuehne.

The President. I believe that the Secretary has received a report from Dr. Butler.

The Secretary. I received from Dr. Butler the report of the Committee on Diseases.*

Gentlemen you have heard the report of Dr. Butler. If there be no objection the report will be received for discussion later on.

The Secretary. I have the great pleasure of announcing the application of Dr. Theobald Smith for membership.

Dr. Kilborne. If it is in order I volunteer the information that if any members of the profession would like to see the Texas Fever Entozoon they can do so by calling at the laboratory of Dr. Smith who would gladly show it to them.

Dr. McLean. In accordance with the notification given yesterday, I desire to offer now for consideration at the next meeting the following amendment of the By-Laws :

Article 1 reads that "any applicant for membership shall have his name proposed in writing by a member of the Association in good standing who shall furnish evidence of the fact that he is, first a graduate of a regularly organized and recognized Veterinary or Medical school ; second, that he is of moral and reputable business methods."

The proposed amendment is to strike out that article except the last clause and substitute this :

"Article 1. Any applicant for membership shall submit his name upon one of the association's application blanks, duly vouched for by one or more members of the association, or by the resident State Secretary of his respective State. He shall be a graduate of a regularly organized and recognized Veterinary School, which shall have a curriculum of at least three years, of six months each, specially devoted to the study of Veterinary science, and whose corps of instructors shall contain at least four Veterinarians. If of a medical school a similar curriculum as to time shall prevail."

This alteration to go into effect after the annual meeting of 1892 it shall not be retroactive nor apply to applicants who were college matriculants prior to its passage.

The President. I will ask Dr. Kilborne to repeat his invitation, as there seemed to be considerable interruption at the time I do not think that everyone heard it.

Dr. Kilborne. I simply announced that if any member should like to see the Texas Fever Entozoon, and they will call at the

* Will appear later.

Laboratory of the Bureau of Animal Industry of the Agricultural Department I know that Dr. Smith will gladly show it to him. I would also say that if any of the members of the profession would like to see the blood of Texas Fever animals that we have several chronic case at the station here at present, which are open for their inspection.

The President. We will now hear the report of the Finance Committee.

Dr. Rayner read the report as follows, which has received and approved :

JAMES L. ROBERTSON, Treasurer,

In account with the United States Veterinary Association.

Balance on hand, September 16th, 1890.....	\$703 43	
Paid Bennett, Edwards and Pettit, stenographers	\$ 81 50	
October, 10, 1890, paid Chairman R. S. Huidekoper, Committee on Legislation.....	166 50	
	<hr/>	248 00
		<hr/>
		\$455 43
In bank.....	\$447 18	
In Treasurer's hands.. ..	9 25	
	<hr/>	\$455 43
Received from Secretary.....	36 81	
	<hr/>	
Balance due per audited account.....	\$492 24	
In hands of Secretary, Sept 1st, 1891	263 04	
	<hr/>	\$755 28

Approved, R. A. McLEAN,

THOS. B. RAYNER,

AUSTIN PETERS,

Finance Committee.

The Secretary. I have the following charge preferred by Dr. Faust :

I herewith prefer charge against Dr. John T. Claris, of Buffalo, N. Y., for manufacturing proprietary and brevet medicines and unprofessional methods of advertising as per proofs at hand (proofs filed) and would recommend that his certificate be with held. (Signed) JOHN FAUST, Poughkeepsie, N. Y.

The President. The charge will be referred to the Comitia Minora and go through the regular course. If there be no further new business we will proceed with the reading of papers. The first is by Dr. Lyford on " Barren Mares." *

* Will appear November number of the JOURNAL.

After the reading of the paper, the discussion was deferred in order to allow Dr. Bryden to read his paper on the Transatlantic Cattle Trade, and its regulations from a Veterinary point of view.

See page 495.

Dr. Michener. I have the pleasure of extending to you a hearty and cordial invitation from Secretary of Agriculture Rusk to make a visit to the Department. You will be able to see much to interest you in many ways. The invitation embraces the experiment station under charge of Dr. Kilborne, a member of this Society. You will be able to see the clinical work he has done. Everything connected with Department we would be glad to have you investigate. The Secretary told me to be very particular to ask each and every one of you personally to come, and I take this means of doing so.

Dr. Faust. At what hour? *Dr. Michener.* Any time before four o'clock. At this point (thirty minutes past twelve o'clock P. M.), the convention took a recess until half past one o'clock P. M.

AFTER RECESS.

At the expiration of the recess the convention resumed its session.

The President. The next order is the paper of Dr. Williams on "Rachitis." See page 477.

The Vice-President. We will now hear the paper of President Huidekoper on the "Identification of animals." *

Dr. Lowe. Before we proceed with the discussion of papers I would like to refer, if it is in order, to an invitation that we have received to-day, as there should be some action taken on it, and that is the invitation of Dr. Michener. (Cries of "Too late to-day!") It may be too late to-day, but we have received a very kind invitation from a high authority through Dr. Michener, to visit the buildings of the Agricultural Department, and I think it would be fitting and proper to accept Secretary Rusk's invitation and visit the buildings referred to in a body, and I would make a motion to that effect.

The Vice-President. The motion would scarcely be in order at this time. It is too late now.

Dr. Lowe. I refer to to-morrow morning. I make the

* Will appear November number of the JOURNAL.

motion that this association accept the invitation of Secretary Rusk as made through Dr. Michener, and we visit the Department to-morrow morning at ten o'clock as a body. The motion agreed to.

The Secretary announced the application for membership of G. Allen Jaman of Chestertown, Maryland.

The Vice-President. We will proceed with the discussion of the reports and papers. The first in order is the discussion of Dr. Butler's report from the Committee on Diseases.

Dr. Faust. One of his assertions was that Dr. Koch has claimed to cure tuberculosis, which statement is wrong and must be stricken out of Dr. Butler's paper. He has never made that statement, never made such an assertion either publicly or privately, as I have read. *Dr. Waugh.* I second Dr. Faust's motion to strike out that remark in the paper of Dr. Butler. *The Secretary.* Dr. Butler simply made a criticism of it and made no absolute statement. *The Vice-President.* Dr. Faust's statement will simply go on record as denying a portion of the report. *Dr. Lowe.* I do not think we have any right to change Dr. Butler's paper. We may of course comment on it.

The Vice-President. We have not any right to take any statement out of the report of Dr. Butler. If there is no further discussion on that paper the next paper in order is that read by Dr. Lyford.

Dr. Faust. Before I came to this place, I saw that there was a paper to read on the subject of "Barren Mares," and naturally I looked up the subject of "Barren Mares," and naturally I looked up the subject to get something that might possibly be of value in this gathering. I found that a man named Friedler was asked by the German authorities why he was so successful, and so much more successful than the rest of the breeders, and he claimed that his success was by reason of the appropriateness of the time when copulation took place. He says that he never had the mare covered—that is the particular mare I am speaking of—excepting on the third day after the heat began and then on to the seventh. From the seventh day, if the mare has not conceived, to the twenty-first and never to return again until the next period. He separates his mare from his horse and recommends very highly not to give too laborious work as to speed or labor and not to feel too high, or as low down as starvation, but to keep the

animal in good sanitary condition, and by no means does he allow his mares to come in contact with a stallion during the time I speak of. To show the correctness of his idea he speaks of seven mares that had a very bad reputation as foal givers. He took twelve mares that had likewise a bad reputation of bearing, one of them over thirty years old, and he reports as a test of his theory that he had eleven foals out of the twelve mares, and he, as I said before, claims that the time or period is worth more than any other theory that has been advanced—of course, diseased condition excluded.

The President. I should like to have seen this brought out a little more clearly in Dr. Lyford's paper. I am very sorry he did not give us more statistics as to the results of using the impregnator as a mechanical means of overcoming the troubles of sterility due to mechanical causes. He made a quotation from Dr. T. G. Thomas that applies to the mare quite as thoroughly as to the woman, and that was that the trouble was first in the neck of the uterus and secondly due to the endometritis. That is the discharge of endometritis in place of being alkaline is acid. Spermatozoa cannot penetrate where there is a discharge of acid fluid. It must be alkaline fluid. I think in a majority of cases that that is the trouble. Again there is no question but what mechanical means for the dilatation of the neck of the uterus will sometimes relieve the inflammation, causing a very slight attack of endometritis and act as a curative agent. Just as the passage of a sound into the urethra where there is stricture will do in cases of gonorrhoea. Take gleet, and a sound changes the discharge from that of a chronic inflammation to that of an acute one which frequently subsides at once. I would ask Dr. Lyford if he can give us the statistics as to the use of these dilators.

As it is advertised as a common article and put forth to the public, it is very misleading. I had a case of a very valuable mare that had been under treatment for a year with dilatations, my first examination and syphoning brought out five gallons of fluid. He spoke of using the pumping syringe. In place of a syringe which I rarely use now in those cases, I have an India rubber tube four feet long, in the end of which I have a lead nozzle over which rubber of the same diameter is stretched. With this I can throw in the quantity of water I wish and get the pressure I want. Where there is a large discharge I allow it to go twelve inches into the uterus and pour the water in. In this way I have a syphon which will clean the womb out entirely and

throw in the amount of fluid that the walls can stand. I think it a safer instrument than the syringe that he spoke of. I think Dr. Lyford should indicate what percentage of sterility he thinks is due to mechanical causes.

Dr. Knowles. I have devoted some attention to sterility for the last four or five years and I believe that a small percentage is due to a constricted os. The most frequent cases of sterility I believe to be following chronic cervical hyperamiae. In regard to the syringe I will say to Dr. Huidekoper that I have a sort of "universal family syringe" that I use for mares in the shape of a ten gallon keg. Attached to that I have a long piece of soft rubber hose. I can elevate this keg to any distance I desire by a pulley and rope, and give such force to the water as I desire, and as little force as I desire. I simply use to rubber tube without any metal appliance at the end of it. The acute cervical hyperamia I have found to be best treated by injections of cold water at a temperature of 65° F. with from ten to twenty per cent. of boracic acid. Chronic cervical hyperamia is not always amenable to treatment, but in a majority of cases it is.

This is a subject though too long for me to talk about here, and as I have quite considerable data and notes on cases treated, I will try at some future date to give you a paper on sterility according to what I know about it.

The Secretary. I was exceedingly interested in the paper of Dr. Lyford on the question of sterility, and assure him that he has enlightened me on many causes that operate in that one disease, that is such a great loss to the breeders of the country. At the same time he has brought in here for us to examine and consider a number of articles which are certainly decidedly out of place. As a body or veterinarians we can give no cognizance to patent articles by the laws under which we operate. That is equally true of proprietary articles, and the remedies here exhibited for us to consider and discuss are certainly out of place. This association cannot be in any way used for the advertising of specific plans of treatment, or of patent instruments, or of proprietary articles. (Applause.)

Dr. Lyford. I do not think there is one of those articles patented. At least not to my knowledge. In the second place Mr. Barnes, of Connecticut, took the pains to send me some homeopathic medicines, which if you all know about as I do you will not hurt yourself with. I brought them here thinking some-

body had experimented with them, and if they obtained results, I should like to know what they were. I have never tried them. I brought them here because he was kind enough to send them for me to look into if I wished to use them. I know nothing about what they are and know nothing further than their labels indicate. I have a number of testimonials from those to whom I have sent my articles wherein they claim that the articles have given good results. So far as recommending them to you I do not think I have flattered myself or the instruments very much in my paper. The question of simply bringing them before the public is simply to show the principle. If they are wrong in principle, I would like some one to get up and say where and how. Or they can take them out in the dark and feel them. (Laughter.)

The Secretary. I referred to a portion of the paper where Dr. Lyford, in speaking of the impregnation, states that it is possible for it to take place without the rupture of the hymen. Does he mean complete or partial.

There were three cases reported of large calculi, or stone, found within the uterus, and one was in an animal that had been served by a horse unsuccessfully. In the other two there was a complete hymen, and the conclusion was that it could not have been put in from the exterior, if such was the case. The stones were not exhibited, but were ordered to be sent to Philadelphia for examination. They were described as weighing somewhere from twelve ounces up to two pounds. There is nothing in the books about it, and I simply ask as to the rupture of the hymen, whether it was complete or partial.

Dr. Lyford. I have examined a good many mares, and as a rule, make an examination before the stallion is allowed to cover them. In a great many cases they claimed to have bred the mare prior to this time, and that the hymen was still intact, and in some cases probably not complete. In a great many of these cases as you pass your hand in and bring it back, you can feel the membrane very plainly.

Sometimes you can draw it outside. I have done this and shown it to parties and students who were standing by. I have known a stallion to cover a mare and the upper part of the hymen to remain intact, and the copulation seemed to be complete and all right. As far as a case that had been in foal with the hymen intact, I do not know of such a case.

Dr. Williams. I would like to make a few remarks. I have

been engaged in practice largely in horse-breeding districts, and mostly with heavy draft animals. In my experience sterility has been due usually to, first excessive fatness and, second, to a plastic condition of the uterus with widely dilating os.

Dr. Bryden. I have listened with interest to this matter of the peculiar characteristics of breeding mares. I think we mistake very much when we commence so far up as going to the matter of copulation. The influences of domestication have much to do in forcing changes in the genital organs, and in other parts of the system, and my impression is that instead of devoting too much time, which of course is laudable in trying to correct these defects, that it would be better to improve our system of managing horses under restraint. Of course where animals are now kept in a stable for six months of a year they do not attain to that robust and symmetrical organization that would be attained if they were running around with greater freedom of action. An important fact is to think of the actual condition of things. Animals with defects of this kind are always animals that are not fit to breed from. Much is to be accounted for by the animal's condition.

Dr. Lyford. Dr. Williams has brought out a point that I had overlooked in my paper, although I had it down as a point. One point he made was that this band attaches to the os and diverges in different directions. I want to call on Professor Baker for an explanation, so that we may hear both sides of the question.

Dr. Baker. In reference to the use of the impregnator, I have no experience, but from my observation I have opportunities of knowing that in many cases it has proved successful and very satisfactory, and I wish to say in regard to an expression of opinion dropped a few minutes ago by the Secretary, that this association should denounce the patenting of instruments, that in my opinion it is a little too finely drawn, and this association as veterinarians, can hardly afford to be too strait-laced in regard to such things. Our interests and the interests of the agriculturalists are closely allied, and anything that is of practical use, whether patented or not, if it is, as I say, of practical use in the advancement of stock raising, we should recognize it and not refuse to give support to an impregnator, for instance, simply because it is patented. It seems to me it matters not whether it is patented or not, if it is useful it should be endorsed. While, of course, this cannot give a positive cure to barrenness in every case, yet we do know that in many cases it has proved very beneficial.

Now in regard to the idea that domestication is responsible for barrenness in some cases. It is possible that in some cases it may be, but we find barrenness in many cases where the animal has not been in anything but natural state. Therefore, in such case, the domestication of course could have nothing to do with the barrenness of the mare. In many cases I am confident that the impregnator may be made very useful.

Dr. Miller. I had in mind to reply to our Secretary some moments ago, but I thought perhaps in doing so I might be called to order by the President or some member of the association as being a little out of order, my remarks being foreign to the subject. I could not very well speak as to the impregnator because it is the first time I ever saw one. I think as Dr. Baker does, that our Secretary draws the lines a little too fine. I can see no comparison between the impregnators upon my left and patent medicines in my front I do not see why any member of this association should be taken to task, even if he recommended an article of that kind, or of any other kind, provided it was beneficial to us in our practical purposes and beneficial to us in our profession. (Applause.) I believe that we are as a class of people doing what we consider best for the elevation and standard of veterinary science, and I believe we are not doing anything to lower it when we recommend anything that we know is practical or otherwise of benefit to us as veterinary scientists. It seems from the statements made here that these instruments have been of great benefit. The fact of these things being advertised in the journal at Chicago, or advertised by the proceedings of the society seems to me to be a benefit to the veterinary science rather than the opposite. We are to-day the only people in existence that I know of who do not advertise their business. If any veterinary college, or this association, put an advertisement of the business in a newspaper, excepting the simple fact that the doctor is a veterinary surgeon, and will be found at a certain house, he would be brought before us for court-martial. I say this is drawing the line too fine, and is injurious to our profession, I believe at the same time that it would be well for us to make no invidious comparison between patents. I take it that upon the whole we should not confine ourselves so considerably to the letter of the law in respect to these matter as they touch the code of ethics.

The Secretary. It has been an established rule in this Association by usage, and in the Constitution and By-Laws and code

of ethics of this Association from its formation, in 1863, that we take no cognizance of any patented article, or any article in which a member of this Association, or member of this profession, sought a patent for. Any instrument or implement of use that any member of this Association had any knowledge of, or any plan of treatment, specific in character, or of extreme value to the profession, that he may have discovered, it is his duty to impart it to us, and it is our right to demand it. From the usages and laws of this Association and from its earliest growth this has been a cardinal principal with us. We are banded together as a body of men. For what? Not for our individual advancement, nor our individual success, but for the welfare of our country. According to your rules and by-laws the article is patented, we must by virtue of the respect we have for those laws, denounce the use of it. Therefore, it ill-becomes a member of this Association to seek a patent on an article by which he will have sole control of that article. Again, we are amenable to him for its use as well as the man who puts up the proprietary remedy and refuses to divulge its formula and puts it upon the market. The usage of this Association is such that no man is allowed to advertise anything but his name and address, and if he is competent in his profession and is fitted for the duty that he has assumed, and exposes himself to the public, there is no town, there is no city, there is no borough in these United States where he will not receive a just measure of reward for the ability that he possesses, and receive in return a fitting compensation for all that he does towards benefiting humanity, and all the brutes of creation.

Dr. Miller. No one appreciates what the Secretary has said better than I do, but when it comes to the poor fellow he speaks of who is cast out in the borough and puts his sign on the window and sits for patients, I know that there will a long time elapse between drinks, and it will be a long way between meals. It will be some time before the people will come to him. He has gradually got to drift into practice and wait for people to come to him. We are the only profession disqualified from advertising, and while I agree that it is right and proper that it should be so, and while if we are deserving of patronage the people will gradually come to us, at the same time I do say that we are drawing the line a little too fine when, as I have heard it expressed here, a man should not even put a thing on his letter-head but his own name. I do not believe in advertising at all, but at the same time I do not believe that because a man puts on his letter-head that he belongs

to a State Society, or to this Society, that he is amenable to the strict laws of the Association. I am not in favor of promiscuous advertising, and do not wish to be so understood.

The President. The paper on the transportation of foreign cattle and its regulation is open for discussion.

Dr. Michener. I wish to say a few words in reply to what the gentleman has said in regard to the regulations that should govern the shipment of cattle abroad. I did not read all of the paper or hear its full reading, but it strikes me that the burden of his song was that while certain restrictions were placed upon steamship companies that similar heathful restrictions were not placed upon the railroad cattle handlers, and should be so placed as soon as possible. I have no reason to question the fact referred to by Dr. Bryden, but take it that the irregularities complained of are only around Boston. We have no such condition in the stock-yards of New York and Baltimore, Philadelphia and Newport News. We have nothing in these yards which appear to be anything like as bad as he details as existing in Boston. I have seen most of these yards I speak of, and instead of the cattle wading in manure up to their knees or bellies, I found the yards to be well paved, to be covered, and cattle protected from the sun. They have plenty of room, too. Another point he makes, is that cattle do not have sufficient rest. I would say that export cattle have, as a rule, twenty-four hours rest at the point of shipment; at least they should have that. If the parties conformed to the rules and regulations of the Department of Agriculture, Bureau of Animal Industry, they would have that rest. That rule is waived in some instances, when they come in a few hours behind time, and where the steamer must sail by a certain hour. Then they go a little short of twenty-four hours rest; but whether they go much short of that I do not know.

In regard to regulations of shipment, as applied to steamship companies, I will say that these rules were only issued after a friendly conference between Secretary Rusk and the Agents of the Transportation lines. The regulations were the result of this conference. There was no objection to any regulation by the steamship people at that time, and I do not see any reason for objecting to any regulation. They seem to me to be eminently fair and proper. Whether those regulations were issued as a humanitarian policy, or a policy of gain, I don't think it is worth while to go into. These regulations were hurried by the agitation

on the other side. We all know of the exaggerated statements made abroad of the cruelty in the shipment of cattle brought over. Upon investigation those charges were found to be unfounded. The export cattle trade to-day is as well conducted, so far as shipments are concerned, as any other trade, and cattle are going over at a less loss at this time than ever before.

Complaint is also made by Dr. Bryden as to shipments across the country, that we do not disinfect the cars fully. I understood him to make that assertion. In reply I will say that we do disinfect all cars.

During the summer, when we were having danger from the Texas or Southern fever, I am glad to say that among export cattle the loss was thirty-three and a third less than heretofore. I hope that in a year or so, by watching all the railroads and stock-yards, we will have nearly wiped it out.

There are very marked improvements that may be made in the transportation of cattle from the interior to the sea-board, and the Department is struggling all it can to bring forward that condition of affairs which we all wish for.

The gentleman spoke of palace stock cars, as they are called. I think that you can understand that the Department of Agriculture cannot champion any one of these cattle car companies and push it on the market, but we are insisting as nearly as we can upon the frequent unloading of cattle. I will state to the Doctor that if he knows of any instance where the cattle are not unloaded and rested and watered at the proper points within the proper hours, he should call the attention of the authorities to it. There is a statute that compels the railroad companies to unload cattle every twelve hours, or something like that. I do not remember the letter of the law exactly, but it is safe to say that the law provides they shall be unloaded every twenty-four hours, or one in every twenty-four hours, and fed, watered and rested. And any body who says the railroad people are violating the statute has nothing in the world to do but bring it to the notice of the United States District Attorney, whose business it is to prosecute the railroad company for such violation. The fine upon conviction is five hundred dollars, and half of the fine goes to the informer. So that if the Doctor knows of these violations he will have no trouble in making some money.

I do not know that I have anything more to say about this matter than I have stated, except to add that cattle are certainly shipped very thoroughly nowadays. I have seen cattle come in

New York by the hundreds of car loads, and I have never seen them come in suffering. The restrictions on the railroads will be more severe in the future, and I have no doubt everything will be done that is practical to do in this great traffic. (Applause).

Dr. Miller. With reference to the shipment of cattle I wish to say a word or two in reply to some statements that were made by the gentleman who read the paper on the transportation of cattle. As has already been said by Professor Michener, if they have in Boston illy-ventilated and badly disinfected cars, that condition certainly does not apply to other parts of the United States. I speak for the port of Philadelphia, positively; and I can say as much for the port of New York, because I have been there very often, and can speak of Baltimore as well. In reference to our yards in Philadelphia, I can say that they are paved and drained and covered. Cattle upon their arrival there are put in those sheds, and we have a particular part of the yard set aside especially for export cattle. They are cared for just the same as they were prior to the time they left the barns from which they came. There are independent troughs in each stall, and separate feeding troughs as well as watering troughs. We know about the time they are to arrive, and there is hay put in the boxes, so that they are not disturbed after their arrival by the putting in of feed. Hay is not given to them in such quantities as to allow them to overfeed themselves. They are then watered and after a while given a little more feed. The cattle are in very good condition when they arrive there. The cars in which they are shipped are the best the railroad can get at the present time. I have a statement made by Martin, Fuller & Co., to me. They are the largest shippers of stock. They told me that during the last year their percentage of loss between Chicago, the principal shipping point, and Philadelphia, had been less than one per cent. Since I have been at that point examining export cattle, I have had but two animals to die upon the road between Chicago and Philadelphia. One of those died from getting down in the car and being overheated, and the other had to be killed at Pittsburg on account of having his leg broken between Chicago and Pittsburg. There has not been the loss of a single animal that left Chicago between that point and Philadelphia, except these two cases I state. That shows you that they must be carefully started from Chicago and in good condition when they come. There is not a car arriving there that is

not thoroughly disinfected before it leaves. The cars are cleansed and disinfected before I allow them to leave port.

Dr. Bryden also stated that there were too many cattle crowded in the cars. I do not know what they do in Boston, but in Philadelphia we do not do that. The cattle are loaded so that they can stand comfortably and have sufficient room at the same time. The cars are loaded with from fifteen to twenty-one head, and if the cattle are very large, only sixteen are allowed to be put in a car. They are all unloaded in Pittsburg, fed and watered and re-loaded in the same cars before being shipped from there, and in the same cars in which they leave Chicago they arrive in Philadelphia. After unloading in Philadelphia, the cattle are detained twenty-four hours, and in very few instances, as a rule, have they been shipped in the steamer before the expiration of the twenty-four hours rest. Where they have been shipped prior to the twenty-four hours rest it has been only by the consent of the Secretary. For instance, a train has been delayed, and they did not want to detain the steamer. In one case I remember that the cattle were delayed all night, and reached Philadelphia too late to rest the allotted time of twenty-four hours, but we allowed them to be loaded on the boat. Otherwise the boat would have been detained twenty-four hours longer than the time set for sailing, and that would have been a great expense to the shippers. I will also add that the cattle are loaded into the boat under my personal supervision.

The Doctor also stated that the space allowed the cattle is not sufficient. The two feet six inches on the Spar Deck will not do. I take exception to that, and you will see the soundness of my exception. To everybody who has had anything to do with the shipping of cattle it is plain that if you put a certain number of cattle in a car, leaving just enough room for them to stand comfortably together they will ride more easily than if they were allowed too much space. If too much space is allowed they will oscillate and bruise each other with the motion of the boat or car. In those boats they are loaded in stalls and four cattle are put in each stall, allowing below deck two feet eight inches, and on the upper deck only two feet six inches. But the regulations will require the new boats to allow 2 feet 6, and we are confined to the old regulations in the old boats, because to make a change now would entail the entire refitting of the old boats, which would be a great expense to the shipper. On account of the rocking in the boat it is necessary that the cattle stand on the upper deck a little

closer than they do below deck. There is also below deck another and different situation from the upper deck. There are other influences working, such as the cattle below not having the ventilation that those above have and they need a little more circulation than the cattle do upon the Spar Deck. If I had the regulation of the matter I would give more room below and give a space of two feet eight inches above. It has been the wish to put the small cattle in as great numbers as possible on the upper deck, and I have to confine myself to that regulation as much as I can. Those cars coming with twenty and twenty-one head I load on the Spar Deck because they do not take quite so much room as the larger cattle do. So far as the port of Philadelphia is concerned I believe that the regulations required by the Agricultural Department are thoroughly carried out. I follow them as far as it is in my power to do, and certainly there has been no cruelty to animals at that place, and I have been careful not to allow any hanging of the cattle in that port. Nearly all the men that go from Philadelphia with the cattle are men who have been going from Philadelphia to London, Glasgow and Liverpool and back ever since we have been exporting cattle from here to there. Of course they take a certain number of stiffs but they go with the regular men who are thoroughly experienced cattle men and are under supervision. The cattle as a rule arrive in London in good condition and with but few lost. When the losses occur they are from storms at sea where they have been washed from the upper deck.

Dr. Faville. I only wish to say a word or two in this matter. I can simply corroborate what Dr. Miller said with reference to the port of Philadelphia and say the same thing in reference to our port at Baltimore. In Baltimore our yards are clean throughout and each yard thoroughly drained and all water is carried off. The yards in Baltimore are dryer and cleaner I dare say than nine-tenths of the farm-yards throughout the United States. Furthermore, in Baltimore they are building an addition to the yards at an expense of \$400,000. \$400,000 will buy considerable lumber and will give a good sized yard. As far as the shipping of cattle in cars is concerned, not one car out of fifty that comes of Baltimore but is one or the other of the so-called palace animal cars.

Our cattle there are loaded not heavier than 15 to 16 and sometimes 17 cattle to a car. Out of something over 58,000 head, we have exported from the port of Baltimore there have

been only 3 or 4 cattle that have been so hurt in transportation as not to be fit to ship. That is a very small percentage. Some of the cattle are not detained in the yard the full 24 hours, because they have not had a long run. This is cattle coming from the vicinity of North Virginia, and Pittsburg. The majority of the cattle remain there nearer 36 hours than 24. So far as cruelty of cattle on board ship is concerned, the scales ought to be a pretty good index, and it is a fact easily proved that very many cargoes gain in transit across the water and weigh more when they reach London or Liverpool than they weighed at the time they left our port.

Dr. Miller. There is one point I had forgotten to refer to. The statement is also made by Dr. Bryden that the cattle are too long in transit across the country. After the cattle are loaded in East St. Louis, or in Chicago, or in Pittsburg, according to the regulation of the Department the Inspector at the point of loading shall notify me at Philadelphia for cattle destined to Philadelphia of their having been shipped. He must send me the list containing the number of the car, the railroad the car belongs to, etc. That list comes by mail. It is not sent by the train as the manifest is. I can say that in about seven-tenths of the cases the cattle will be in Philadelphia and I will get the manifest from the railroad company before I get that order through the mail, notwithstanding the cattle will have been unloaded and fed in Pittsburg. That shows whether they come through quickly or not.

Dr. Faville. I have had the same experience two or three times.

Dr. Bryden. The method pursued at present in carrying out the shipment abroad is not one which will bring better results, so far as freedom for hardship is concerned, as was obtained under the old system when there were no regulations for the shipment of animals. The fact is that they have attacked the wrong end. The Inland transportation has most to do with the condition in which the cattle are received abroad. You go to work and embarrass the ships, I say that is wrong, I simply make these remarks as showing that somebody has been doing an inconsistent thing.

Dr. Miller. The gentleman makes a statement here which if true in Boston seems very strange. He said the United States Government had four steamship lines to do certain things. Now it is a fact that all these arrangements have been brought about after having conferences with the agents of several steamship

lines themselves, as well as of the agents of railroad companies. I have this directly from the Department. They inform me that these arrangements were made after a thorough consultation with several steamship companies' agents, and the agents of the railroad companies, so that if the arrangements are not satisfactory to the transporting lines they have themselves to blame. He made the statement that distillery cattle had been shipped from Canada and elsewhere, and from twenty to twenty-five died on the wharves at a time in Boston. I do not know what kind of distillery they feed up there. But it is not so down our way. Cattle were shipped through from Kentucky to Philadelphia during the hot weather last month with the single loss of but one animal; 639 head came all the way from Covington, Kentucky, and were loaded on the boat at Philadelphia within twenty-four hours after their arrival at that point, and every one of those animals were received from the distillery at that place, and but one died. If all the grievances exist that the gentleman complains of he is guilty himself of not stopping them, as a simple complaint to the United States Prosecuting Officer would have brought the guilty party to justice. If he knew of these abuses he should have gone to the authorities and complained that the railroad people were wantonly killing the cattle. He is guilty himself if he did not make complaint. He should, if a citizen of the United States, have made complaint. He should have made complaint that the railroads and transportation companies were not complying with the law, and I do not believe anybody in the country would be more ready and anxious to punish the offender than the Secretary of the Agricultural Department.

Dr. Bryden. Instead of changing the spaces on the ship I should say it would be better to change the size of the stanchions. Do you mean to tell me for a moment that a great distillery is as good a place to ship cattle from, as a stock-yard is? The chances for doing wrong in a stock-yard are entirely obliterated. I say further that instead of changing your ships, you ought to see that no animal of a certain grade is allowed to be shipped. That is the point. Make this a respectable business, and ship no cattle except it comes up to a certain grade.

Dr. Faville. In conversation with the manager of the steamship line running out of Baltimore within the last week or two he very emphatically said that if they could do away with the regulations established by the Agricultural Department and which we are enforcing, that they would be most sincerely and empha-

tically opposed to it. In other words, they prefer to have the regulations enforced to the letter on all of their boats rather than go back to the old way of go as you please.

Dr. McLean. I move that the discussion close.

The motion was agreed to.

The President. You now have before you the discussion of the paper of Dr. Williams on "Rachitis."

Dr. Miller. I wish to say that I consider it one of the best papers on that subject I ever had the pleasure of listening to. I was interested in the case of a colt which has similar to the case cited. I had under my treatment a similar case. The cases were almost identical. The colt belonged to Dr. Agnew. There was the enlargement of the bones and everything else. Before the colt died the limbs softened so that the legs separated at the joints. The doctor would not allow the colt to be killed, as he wanted it kept in the interest of science simply to see how long the colt would live in that condition. The colt lived thirty-six hours after the legs began to drop off. The bones were placed in a barrel and there are many that have already crumbled and gone to pieces.

Dr. Faust. The hour is too late to give this paper a full discussion. This is the first time to my knowledge that I ever heard in the English literature that these three diseases were identical in their pathology. I refer to "Rachitis," "Osteo Porosis" and "Osteo Malasia." My heart jumped for joy when I found somebody to think as I had thought, and as I have found universally accepted in the best German Works.

Dr. Berns. I was very much interested in it, and I think a good thorough discussion on the subject would be not only interesting but beneficial to all. But as the hour is getting so late I would prefer that the discussion lay over until our next meeting. The paper was a lengthy one. We need more time to study it carefully, and such study will conduce to a more intelligent discussion when the matter comes up again. I hope the discussion will be laid over until the next meeting.

The President. If there is no objection it will go over. I thing the suggestion is a good one. I agree with what Dr. Faust has said. I am glad that some one has made public the identity of the three diseases. The hour is getting late, and I would like

to know if there are any suggestions in regard to the paper I have read. If there is no further discussion I will, as President, announce the Board of Censors for the following year.

DR. J. T. WINCHESTER,	DR. WILLIAM DOUGERTHY,
DR. R. A. McLEAN,	DR. A. LIAUTARD,
DR. T. B. RAYNER,	DR. J. H. STICKNEY,
DR. OLOF SCHWARTZKOPFF.	

The Committees will be appointed and announced later. We will now hear the report of the Treasurer, which was read.

The Secretary. I move that the Association extend thanks to the Washington Local Committee and the Baltimore Committee, and the proprietor of Willard's Hotel for the courtesies extended and the reception on the whole given us by the entire community,

The motion was agreed to unanimously.

There upon (five o'clock and thirty minutes P. M.), the Convention adjourned *sine die*.

BOOKS AND PAMPHLETS RECEIVED.

Bulletin de la Société Zoologique de France, Paris.

Der Zoologische Garten, edited by *Dr. F. C. Noll*, Frankfurt, a. M.

Annalen des K. K. Naturhistorischen Hofmuseums, redigirt von *Dr. Franz Ritter*, von Hauer Wein 1891. Bd. vi. No. 1-2.

Jahresbericht der Naturforschenden Gesellschaft in Emden- 1889-90.

Verslag van den Westand van het K. Zoo.-Bot. Genootschap. Te S. Gravenhage. 1890.

Journal Bombay Natural History Society. Vol. vi, No. 1.

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BARREN MARES.*

C. C. LYFORD, M.D., D. V. S.

The subject of sterility, or barrenness in mares, is of vastly greater importance than one would at first be led to suppose. Only those who are actually engaged in the breeding business, or are professionally called to treat such cases, can comprehend the extent, as well as the serious nature of many of these complications. Besides, in a pecuniary point of view, it is of the greatest importance to the owners of studs, as well as of mares, as very often the most valuable animals used for breeding purposes are practically of no use outside of the harem, and as a consequence, are a source of expense without any returns; when on the other hand there should be a source of revenue, often of the highest character.

Successful fecundation is generally looked upon as a sure result of coupling the male and female sex at a certain period. Fleming says: "Successful fecundation, however, is not always the case, and in some species, particularly the equine, sterility, temporary or permanent, in the female, is far from being uncommon, and is sometimes serious."

The same writer says that in the studs of France, the fruitful mares are 59.57; at the Haras of Pin, during a period of twenty years, there was a percentage of 68.27 fecund mares, abortion 5.06. This would have about 64.82 to have colts. These figures indicate that only one-half, or at the most, two-thirds of the mares produce

* Read before the United States Veterinary Medical Association, Sept. 16th, 1891.

foals. Quoting from Fleming's *Obstetrics*: "Sterility may depend upon organic or physical causes, and may amount to permanent impotence, more particularly when congenital, and located in the generative apparatus. Monstrosities, hermaphrodites—animals in which one or more important organs of the sexual apparatus are absent, and hybrids are generally permanently sterile."

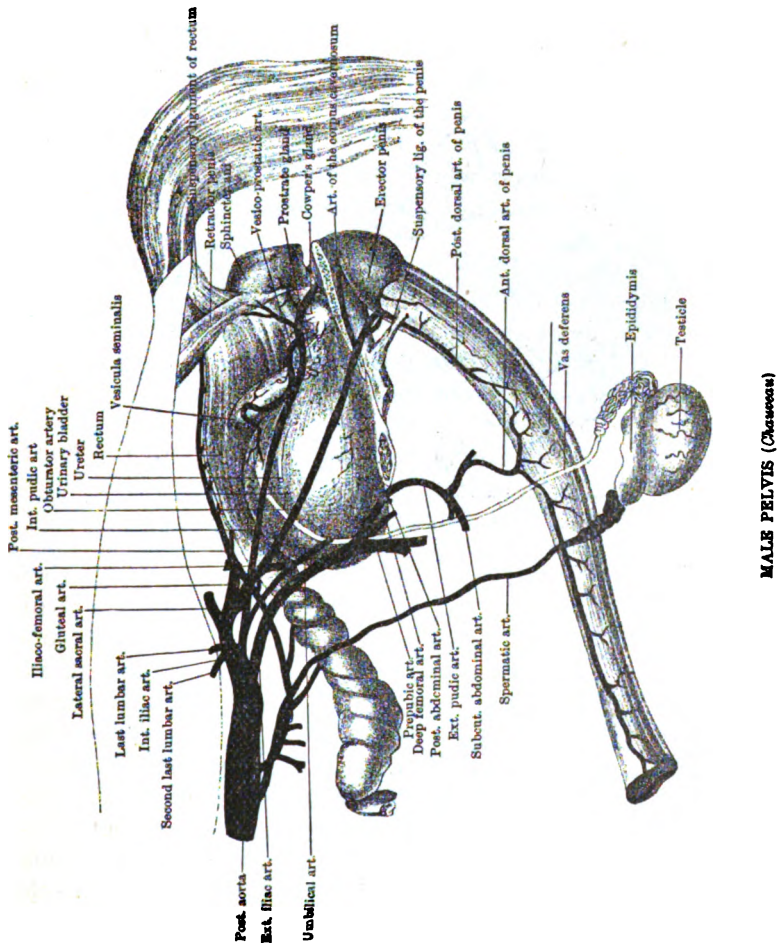
"Prolonged continuance and old age are not infrequent causes of infecundity; as is witnessed in mares which have worked for many years in towns, and have then been transferred for breeding purposes." "It may likewise be due, though temporarily, to premature or tardy coition, when the generative organs are not in a physiological condition for conception or when they are in an irritable, abnormal state. Under-fed or over-fed animals generally do not breed so readily as those which are in moderate condition—fat animals are especially unfruitful, excitable, vicious mares, are less likely to procreate than those which are of an equable and gentle disposition. The latter are often impregnated at one attempt; and it has been observed that with mares accustomed to work, active exertion, even to produce fatigue before being put to the horse, is favorable to conception. So it is that the Arab submits his mare to a severe gallop, and brings her almost breathless before the stallion, when, the act being accomplished, he leaves her quietly at rest for some hours."

I have known of one case where of a litter of six boar-pigs, four were fed sugar and molasses to hurry up growth, after which all four proved to be barren, while the two that were turned out on ordinary feed were productive. Again, various diseased conditions of the generative organs, as well as general derangements, may also prove antagonistic to fecundity. There may be disease or alterations in the ovaries, Fallopian tubes, uterus or vagina, which will hinder conception; and if any material obstacle to the contact of the spermatic fluid with the ovule be present in these parts, fecundation cannot take place. Tumors of various kinds in this region are not infrequent cause of sterility. Rueff and others have observed an imperforate, dense and tough hymen to be a cause of infecundity in the mare.

In all of these conditions, a careful examination should be made, as removal of the obstacle to generation may be quite within the scope of surgical or medical measures. More particularly is this the case when the obstacle is related to some abnormal condition of the cervix uteri a circumstance more common than is generally supposed. In rare instances dilation may require to

be effected by a cutting instrument but this should not be resorted to until the simpler and safer means have failed.

Before taking into consideration the diseases to which the organs are subject, I will notice, briefly, the anatomy of the parts, both male and female, and their physiological functions.



Anatomy of the Organs of Generation. The penis, not only supports the greater part of the excretory, urinary canal but also transmits the sperm of the male.

The penis proper consists of the corpus cavernosum, extending to and forming the bulb, tapering gradually at the anterior

extremity of the penis, occupying the upper surface and divided by a septum into two lateral halves ; grooved on its under surface for the corpus spongiosum and urethra. The corpus spongiosum encloses the urethra, extending from the crura posterior passing to the external extremity, which expands to form the glans.

A review of the anatomy can best be made by reference to Figs. 1, 2, 3, 4 and 5.

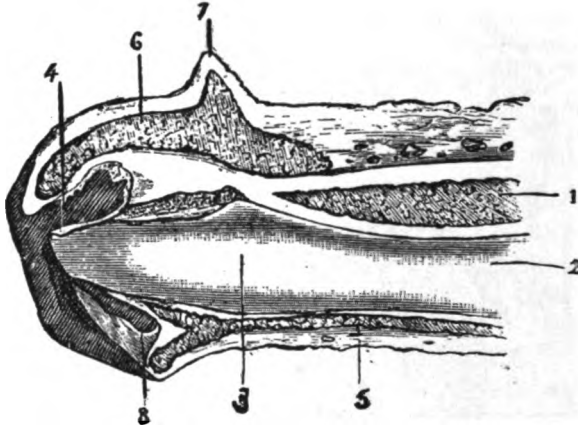


FIGURE 2.—Longitudinal Section of the free extremity of the horse's Penis in a relaxed state.

1, Erectile tissue of the corpus cavernosum ; 2, Urethra ; 3, Fossa navicularis ; 4, Urethral tube ; 5, Erectile tissue of the urethra ; 6, *Ditto* of the glans ; 7, Corona glandis ; 8, Urethral sinus.

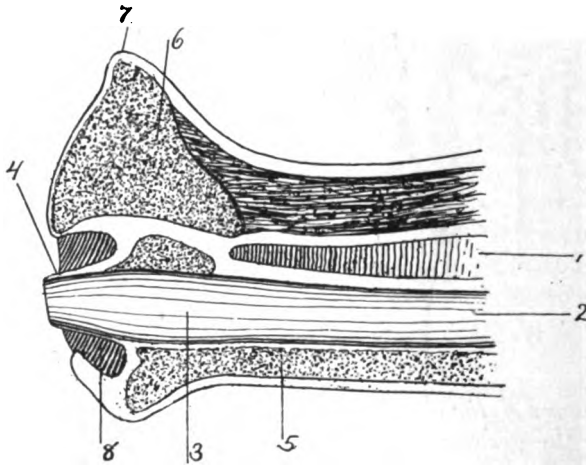


FIGURE 3.—Longitudinal Section of the free extremity of the penis in an erect state.

1, Erectile tissue of the corpus cavernosum ; 2, Urethra ; 3, Fossa navicularis ; 4, Urethral tube ; 5, Erectile tissue of the urethra ; 6, *Ditto* of the glans ; 7, Corona glandis ; 8, Urethral sinus.

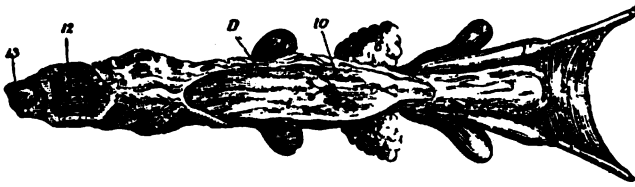


FIGURE 7.—Bladder and interpelvic portion of Urethra opened from below.

1, Vas deferens ; 1', Bulbus part of the same ; 2, Peritoneal fold lining the vas deferentia ; 3, Bladder ; 4, Vescicula seminalis ; 5, Orifices of Ureters ; 6, Prostate ; 7, Verum montanum with orifices of ejaculatory ducts ; 8, Orifice of prostatic vesicle ; 9, Cowper's Gland ; 10, Orifices of ducts of prostate ; 11, Orifices of ducts of Cowper's Gland ; 12, Corpus cavernosum ; 13, Corpus spongiosum with Urethra in its center.

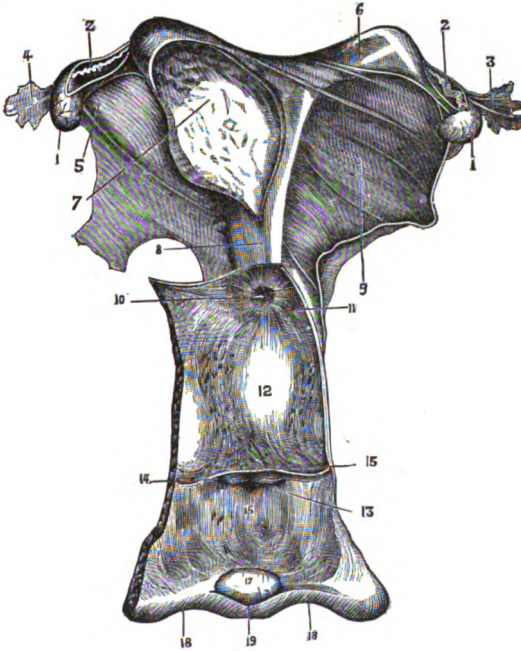


FIGURE 5.—Generative organs of the mare, isolated and partly opened.

1, Ovaries ; 2, Fallopian tubes ; 3, Pavillion of the tube, external face ; 4, *Ibid*, inner face, showing the opening in the middle ; 5, Ligament of the ovary ; 6, Intact horn of the uterus ; 7, Horn thrown open ; 8, Body of the uterus, upper face ; 9, Broad Ligament ; 10, Cervix, with its mucous folds ; 11, *Cul de Sac* of the vagina ; 12, Interior of the vagina, with its folds of mucous membrane ; 13, Urinary meatus and its valve ; 14, 15, Mucous fold, a vestige of the hymen ; 16, Interior of the vulva ; 17, Clitoris ; 18, Labia of the vulva ; 19, Inferior commissure of the vulva.

Physiological Conditions of Copulation.—It will be necessary to describe the physiological conditions of copulation to show upon what depends the normal action of the respective organs, male and female, during the act of coition. That the male organ, the penis, should be erect is necessary, and that the glans should vary considerably from their normal state is also essential. It will be seen by reference to figure, number three, that the glans and penis assumes the form of a valve and piston. The enlarged glans should fill the transverse diameter of vagina so completely as to withdraw and expel the air thus forming a vacuum within the cervix and uterus, and in case the cervix is kept sufficiently open and retained in the center of canal either by natural or artificial means so that the urethral sinus of the glans shall fit the corresponding posterior surface of the cervix, and that the projecting end of the urethral tube may approximate most closely or even fit into the opening of the os. Accordingly, should no obstruction exist between vagina and uterus, these conditions assure a complete injection of semen into the cervix and uterus, and as the glans assumes its natural size by its withdrawal from the vagina, allowing air to pass into the uterus, it practically assures the access of seminal fluid.

It is evident that a variety of influences may interfere with the performance of the natural process of fecundation. For its accomplishment, four things are necessary:

First, The possibility of the entrance of seminal fluid into the uterus. *Second*, The possibility of the production of a healthy ovule. *Third*, The possibility of the entrance of the ovule into the uterus. *Fourth*, The absence of influences in utero destructive to the vitality of the semen, and preventive of fixation of the ovum upon the uterine wall.

Should these four conditions exist, no animal will be sterile. She may not bear a foal, but the incapacity may attach to the male and not to her.

The special causes of sterility, or those interfering with these conditions, may thus be presented:

First, Causes preventing entrance of semen into uterus: *a*, Absence of the uterus or vagina; *b*, Persisting hymen; *c*, Vaginismus; *d*, Atresia vaginæ, or complete obliteration; *e*, Occlusion of cervical canal; *f*, Conical shape, elongated cervix; *g*, Patulous os and flaccid or flabby condition of uterus; *h*, Endometritis, or leucorrhœa; *i*, Polypi, or fibroids; *j*, Flexion of uterus; *k*, Very small os internum; *l*, A curtain of membrane either, or both, external or internal to cervix; *m*, Equine syphilis.

Second, Causes preventing the production of a healthy ovule: *a*, Chronic ovaritis; *b*, Cystic disease of both ovaries; *c*, Cellulitis or peritonitis, obliteration of Fallopian tubes; *d*, Absence of ovaries; *e*, Hemorrhage into ovaries; *f*, Undeveloped state of ovaries; *g*, Atrophy of ovaries from old age.

Third, Causes preventing passage of ovum into uterus: *a*, Stricture or obliteration of Fallopian Tubes; *b*, Absence of Fallopian tubes; *c*, Detachment and displacement of Fallopian tubes.

Fourth, Causes destroying vitality of semen or preventing fixation of impregnated ovum: *a*, Corporal or cervical endometritis; *b*, Membranous dysmenorrhoea; *c*, Menorrhagia or metrorrhagia; *d*, Abnormal growths; *e*, Areolar hyperplasia.

Absence of Uterus or Vagina.—I have met with but one case of absence of the uterus. During the summer of 1872, a young heifer showed signs of rut, and having a bull much larger than she was it was not surprising to have her look droopy after copulation, especially as she was pushed through an ordinary board-fence at that time. The heifer was allowed to stand around and attend to herself some three or four days; during which time she continually strained as if to urinate, occasionally passing a small quantity of blood. Having killed her about the fourth day I made an autopsy finding the abdominal cavity containing several gallons of urine and a hole through the anterior portion of the bladder, showing that the penis had passed through the meatus urinarius and ruptured the bladder. Two small congested ovaries were found but no uterus.

Persisting Hymen.—I have met with quite a number of cases of this kind and in most of these it was thicker than natural; some of the cases requiring considerable force to rupture the membrane.

Vaginismus, or hyperæsthetic state of the os vagina, which results in spasms of sphincter.—These cases are by no means rare, and are a common cause of sterility. It not only interferes with the entrance of the male organ, because of the pain induced, but prevents the seminal fluid from getting into the uterus, as the stallion in these cases is usually prevented making a closer cover besides the spasmodic condition completely closing the cervix.

Atresia of the vagina is not very common in mares, and then follows laceration, or an organization of inflammatory lymph. These conditions, however, appear very common in cows; more often following the first calf than subsequent cases. The treatment

is generally unsatisfactory, requiring instruments and surgical treatment which is often of no avail. The results being anything but satisfactory.

Occlusion of Cervix or Rigidity of Os Uteri.—According to Fleming, "occlusion of the cervical canal may be due to spasmodic conditions of the muscle and cervix. If, however, there be hypertrophy in this organization or rigidity, then an operation will be necessary.

Both rigidity and spasmodic condition of the os uteri are of very common occurrence and are liable to be associated with many of the other troubles of the female generative organs. The spasmodic condition may be simply a consequence of irritation elsewhere. This condition is most common in young mares that have never conceived; but I have met with one case of rigidity when the mare was twenty-three years old, and was the dam of several colts. I have also met with the spasmodic condition in some cases during one heat, while at the next period it had entirely disappeared. This will, I think, account for many of the cases which have been served repeatedly during a season and all at once conceive by a single leap from another stallion or even the same one.

Conical shape of Cervix and elongated Os Uteri is a very common cause of infecundity. By its bending on itself it may not admit the seminal fluid through the canal, and as a rule completely prevents it. This state of affairs not only causes trouble with the breeding of mares but also in the human family. Thomas, on diseases of woman, says, "my experience leads me very positively to the conclusion that excepting endometritis, this is the most common of all causes of sterility, and fortunately remediable." "The treatment recommended varies somewhat in the human family with the length of cervix from dilation, bilateral operation and amputation." It is very apparent with these conditions in mares that the cervix does not draw down and become flat and open as it should do when the vagina "bellows up," or become rigid as it should ordinarily during copulation. For these reasons the cervix is left projecting into the vagina to the extent of two or three inches; consequently the glans penis presses it to one side during the act of copulation, and there is little or no chance for the semen to get into the uterus. When the pressure is removed the cervix projects into the vagina thus preventing the semen from entering. Right here, I will say it is not necessary for the cervix to be tense and closed, for I have known many cases where the cervix was

long loose and flabby with an opening sufficiently large to admit two fingers, and still the mare fail to conceive until artificial means were used. I wish to sight but two cases here of the tense or closed os:—one, Belvedere by Mambrino Patchen, another, Gypsy Queen by Polanios—and one case of elongated, patulous cervix in a mare of my own, Mabil H, 2:26, by Col. West, 2579. In regard to the first two cases, I will quote from the letters received concerning them. Byron G. Kimball, of Maple Stock Farm, Bradford, Mass., says: "The mare, Belvedere, I bought of William Trumbull, of New York City, for Col. H. A. Hale of Bradford, and sold her at a sale in Boston, where she was bought by W. H. Phelps of Minneapolis. I had bred this mare according to my books on an average of twice a month for twenty-seven months with Warder Hudson and various other stallions. I tried an impregnator on her but it did no good. It was rubber but more bell-shaped than yours." Dr. O. J. Evans, of Evansdale Stock Farm, Minneapolis, Minn., says: "Having used your impregnator on my Membrino Patchen mare Belvedere, nineteen years old, that was bred by Mr. Henry Hale, of Bradford, Mass., to Warder by Belmont and to Hudson by Kentucky Prince, and by H. W. Phelps of Minneapolis, Minn., to Bayardo at least four times all without impregnation, and having succeeded in getting her in foal during first heat by Red Chieftain using the impregnator, and having used it on several other mares that had refused to breed one or more seasons, among them, Gypsy Queen, by Polanios, she being a mare, twelve years old, and had been bred to different horses at least four seasons without becoming in foal. I must also state that neither Belvedere or Gypsy Queen had ever been in foal until this season and both are now sure."

F. W. Muckey, Minneapolis, Minn., says, "I owned the bay mare Gypsy Queen, and bred her two years without success. I then sold her to J. K. Sidall, of Minneapolis, thinking her barren, as she was a young mare and we had used every means then known to the profession. Since then she has become the property of Dr. O. J. Evans, and I understand he has been unsuccessful until he used your "Impregnator," and with the first trial succeeded in getting her in foal." In regard to the case of elongated patulous cervix in Mabel H., she was a mare who at the age of five years had had a filly by Phallas 2.13¾. The next two years she was not stinted but was returned to Phallas for the season of 1887 and 1888, but failed to conceive. In February 1889 she was sent to T. B. Merritt's Farm at Rosemont, Minn., and was stinted

to Nutwood Membrino until June 12th, without any good results. June 13th, 1889, I again had her returned to Nutwood Membrino using an Impregnator from which she conceived; the result being a chestnut foal, born June 13th, 1890, now registered Vol. X. Wallace Trotting Register as Woodnot 15234.

Patulous Os or flabby condition of the Uterus.—These cases are very common in mares, generally in those which have had foals or aborted, but are sometimes seen in mares which have never been in foal, or even stunted. The cervix is very loose and flabby, which is often more or less associated with a like condition of vagina and uterus; the os at times being so open as to admit the entire hand with little or no resistance. I had a cases of this kind at the Bruce Stock Farm, Rosemont, Minn. The mare had aborted over a year before, since which time they were unable to get her in foal. She appeared otherwise in good health, worked every day and kept in good heart and flesh. I had the uterus and vagina flooded daily for five weeks using for an injection, alternate days, carbolic acid 1—100 warm water, corrosive sublimate 1—1000. This was continued until signs of heat returned the second time, when after being stopped her cervix was swabed out with iodoform ointment 1—10 and the third day was served. The os had so contracted that the large sized impregnator went in with difficulty though the dilater was used. When examined before treatment her cervix would admit with ease the entire hand; the uterus and vagina being especially flabby. The mare has since failed to receive another embrace though repeatedly tried for over three months and shows every indication of being in foal.

Another case of this kind was one of my own, Nellie Gray, Dam of Mabel H.; a mare twenty years old, having failed to conceive for five years—and having aborted six years ago—though being repeatedly stunted to various stallions before I purchased her in 1889. I had her stunted during the season of 1889 to Col. West, 2579, and during the season of 1890 to Morrel Tyrant and Greymont, the last two being young stallions, but to no avail. During the fall of 1890 I examined her, finding the cervix not only sufficiently open to admit easily three fingers, but the cervix was torn on its upper portion and on the right side of *cul-de-sac* of the vagina from the vagina wall to cervix was a complete honeycomb; having evidently been lacerated at various times during copulation. Having decided to give her tonic treatment and regular exercise, she was left without further stinting until April 1891, when I examined her and found the vagina and cervix nicely con-

tracted and in heat. She was then stunted to a three year old son of Jersey Wilkes, from which she is now surely in foal.

Various modes of treatment have been tried for the lax, weakened condition of cervix and uterus, which may be classed as constitutional and local. The former class of remedies I have not given a thorough trial, though the cases on which I have used them indicate favorable results. These consist of general tonics and especially stimulating and invigorating aphrodisiacs; such as phosphorus, cannabis indicus, nux vomica, ergot and arsenate of iron. Also saw palmetto Fld. Ext.

Local treatment, such as swabbing cervix with tr. iodine and iodoform, as well as stiptic, astringent, and antiseptic injections have apparently proven beneficial in a number of cases.

I believe that electricity will prove itself very useful in these cases; especially where applied locally to the cervix, vagina or uterus.

Endometritis fills the uterine canal with a thick tenaceous mucus and often prevents the entrance of seminal fluid or destroys its vitality. We meet with quite a good many of these cases in the mare, and they vary very materially in the consistency of the secretions. Endometritis and resulting leucorrhoea are the most unsatisfactory diseases we have to contend with in the treatment of barrenness. In the first place it is far from being an agreeable task, and as the cases are generally of long standing when we get them, they are not only the more difficult to cure but the time and expense often exceeds the value of the animal. The mare as a rule is emaciated; cannot stand hard work, and, though her appetite is often good, fails to put on flesh. The discharge is of a viscid, glassy or creamy character—often with a peculiar odor, which we require to smell but once to remember; especially in every case you get to attend at college, when you have to depend upon your fellow-students to assist you in treatment, particularly the injections, the smell stays by you often for a day or more, no matter how often you wash or use disinfectants. I am glad to say that the balance of my cases have been looked after by the owners or persons in charge, though it is often a great deal of trouble to get them to follow your instructions, and get anything like favorable results. Mineral and vegetable tonics and mineral acids have generally proven beneficial. Antiseptic injections, not too strong, also perox. hydrogen; as there is some danger of overdoing. Unless the os is flaccid and well dilated it is better to keep the parts open to allow drainage; as

I have known of cases when fluid was retained from one day to the next, the horns of the uterus often being relaxed.

Polypi, fibroids and moles are not very common in my experience; having met with but three cases, all of them being outside of cervix, and were very easily cured by excision, stiptic and antiseptic dressings.

Flexion of uterus and cervix is not uncommon. In this the os is turned to one side and during copulation it would be pressed against the wall of the vagina, entirely obstructing the passage to the uterus. Huntress 2.21 is said to be one of this kind; having been examined by R. C. Mason, V. S., of Winona, Minn., who reported the case to me as such a decided flexion that he was compelled to turn his finger almost at a right angle to get through the cervix.

Very small os internum. It is a common thing to find barren mares who have been continually bred and repeatedly opened by breeders, stablemen and even veterinary surgeons, without the inner portion of the os being dilated, and at other times a membrane across the os internum which is not ruptured. As a consequence they fail to conceive as effectually as if the membrane were over the vaginal surface of cervix.

A curtain of membrane, either or both, external or internal to cervix.—A very interesting case of this type came under my treatment during the month of July, 1891. The mare was sixteen years old, and had failed to conceive, though stunted repeatedly at different seasons for the past ten years. I had known the mare some six years, she having been served by one of my own stallions during the year of 1886 but had given the case no special attention, and at that time knew nothing more than that she was claimed to be very tight by the man who dilated her os. She was given several leaps but did not conceive, and she was stunted every season following to different stallions but to no purpose. She was then sent to Dr. Curryer & Sons' stud at Crystal Lake, Minn., with instructions to use the impregnator. The Doctor was unable to find the os uteri; it being concealed by folds of mucous membrane. I was called to examine the case and found a fold of membrane reflected from upper vaginal surface of the os. Having passed one finger underneath the fold of membrane with a good deal of difficulty, I succeeded in dilating it sufficiently to get one finger through the cervix. I could then easily feel a second membrane at internal opening of cervix, but my finger not being long enough to reach

membrane was so strong that I could not tear it. By taking a small impregnator and dilator which is about one inch longer than my finger and passing it through the cervix until the disk of impregnator came in contact with the vaginal surface of cervix, I then made a thrust by pressure to handle of dilator at the same time turning it laterally. I then withdrew the dilator leaving the impregnator in position. The mare, at once, by straining, threw off at least three pints of viscid, creamy fluid, which had no odor. I then had the uterus washed out, which was continued daily until appearance of heat returned some two weeks later. She was then served, using the small impregnator, and has since passed three periods or about six weeks, having been tried twice a week without any signs of returning heat. I simply wish to call your attention to the facts concerning this case: The mare had been repeatedly opened by parties who would generally be considered competent judges and capable of opening mares to breed. This mare had been so treated by several such men besides having been examined by a graduate veterinary surgeon, who also used the small sized impregnator, having succeeded in placing it without the dilator. The external fold of membrane was reported, but the internal one was not noticed, and not being ruptured, there could be no chance of conception so long as it existed.

Equine syphilis has proven a great hinderance to breeding by rendering pregnancy both uncertain and unsafe, and requires especial consideration for which I would refer to W. L. William's article on equine syphilis in *American Veterinary Review*, 1888.

CLASS II—*Causes preventing the Production of a Healthy Ovum.*—I will notice but one the atrophy of ovum from old age and lack of use, as it will be seen by reference that none of these are curable diseases. I wish to note but one case, that of a black mare, record 2:53¼, belonging to me; I having bought her in 1887 to experiment on. She had never had a foal though bred several seasons. After various trials, even by injecting semen through the cervix, she continued to return in heat, and in December, I decided to kill her and hold an autopsy. The uterus, vagina and cervix were healthy and in every way normal, but on examination of ovaries, they were found to be pale and atrophied; showing no signs of graafian vesicles, or any indication of having produced any ovum for months, possibly for years.

III.—*Causes preventing Passage of Ovum into Uterus*, such as strictures or obliteration of Fallopian tubes, absence of Fallopian

tubes, detachments and displacements, simply require mentioning to show how certainly they would prevent conception.

IV.—Causes destroying Vitality of Semen or preventing Fixation of impregnated Ovum.

a. Endometritis, corporal or cervical, fills the uterine canal with mucus which either prevents the entrance of semen, or destroys its vitality, and has already been considered.

b. Abnormal growths of any kind which fill the uterine cavity, as for example fibroids, polypi, etc., may prevent attachments of the ovum to the uterus even if impregnated.

c. Membranous dysmenorrhagia, menorrhagia or metorrhagia and areolar hyperplasia are seldom if ever seen in mares, hence will be given no further consideration.

MALE STERILITY.—Lack of erectile power in the male is not uncommon and varies with different stallions as well as the same stallion at different seasons, or portions of the same. At the beginning of the stud season many stallions fail to perform service with sufficient ardor, although they have been good coverers seasons previous. This may be caused by lack of tone from non-use, though at other times such a state of things follows certain diseases; such as catarrhal fevers, distemper and the like, as well attacks as of spinal meningitis. In other cases the blood supply may be interfered with from partial or complete obstruction to one or more of the arteries supplying the penis.

During the spring of 1886, a stallion was brought to my infirmary with apparent paralysis of the penis; the parts hanging pendulous, protruding about six inches. The season previous he had covered about sixty mares, and had gone into winter quarters in good shape, but during the winter suffered from an attack of catarrhal fever, during which time his owner reported him badly swollen about the penis and testes, after which penis remained pendulous. The stallion had already been blistered across the back several times. I applied electricity to the parts, which would at the time produce partial erection and so strengthen them as to enable him to withdraw within the sheath, but he never regained power of erection or afterward performed stud service.

During the Spring of 1889, I was consulted in regard to a stallion, who, the previous season, had served forty mares, and was sold with a warranty of a sure foal getter; but, as he would not cover a mare at the beginning of the stud season, the party

purchasing naturally suspected he had been cheated. I recommended as treatment:—Fl. Ext. Nux Vomica, Liq. Pot. arsenitis, Fl. Ext. ergot, and citrate of Iron, alternating with phosphide of zinc and sanguinaria. This treatment was continued but a short time when the animal's vigor returned, and there was no further trouble that season. I also had a case of my own, a four year old stallion, who had been a good coverer until the Fall of 1888, when I loaned him to cover some mares in the country, at which time he was kicked in the front leg and nearly died as a consequence of erysipelas and distemper which followed. The following season I could scarcely get him to cover a mare, and then invariably failed to get them in foal until the foregoing prescription was used, when he succeeded in getting all five mares in foal.

Absence of spermatozoa is not uncommon especially in colts less than two years old, and as a rule at any age, should the testicles not appear in their natural locality, the scrotum. In cryptorchids, as a rule, when neither of the testicles appear visible, no spermatozoa are to be found.

Old age is a common cause of impotency, but a great deal can be done to tone up these organs, and revive the natural functions by judicious use of some of the remedies which prove so beneficial in the lack of erectile powers.

Excessive length of penis is far from being an advantage either to male or female. Such stallions are seldom sure foal getters, and often injure the mare during copulation. I have found in these cases great advantage in using a shoe-boil boot as a washer, thus keeping six or eight inches of penis outside the vagina, and in many cases, it has insured foals, where the stallion was considered not only unsafe to the mare but uncertain as a foal getter. On the contrary, stallions with a short penis will cover a greater number of mares, and succeed in larger percentage of foals.

During the Summer of 1882, I stunted two mares to Seneca Starr; he was a large horse with excessive length of penis and a very ardent coverer, though apparently not a sure foal getter. Having previously injured several mares and killing one by lacerating the fundus of vagina, I decided to try one by using a shoeboil pad as a washer. The move succeeded in getting her in foal at the first service. The other mare was stunted without making use of the pad, and though returned several times, did not get in foal, though she had been a regular breeder before and had a colt by her side. The only mare in foal to Seneca Starr that season was the one on which the pad was used. The next season

the pad was made use of in serving mares to him and as a result he got some twenty mares in foal.

Weakness of Spermatozoa—There is little doubt that the vitality of spermatozoa differs very materially in different stallions as well as in different kinds of animals. I have at various times examined spermatozoa under the microscope from different stallions after castration, as a rule, having a pail of water in which to place the testicles after removing them. By so doing they were all kept as nearly as possible under the same atmospheric conditions. The only difference being the length of time between subsequent castrations. When ready to make microscopic examination of semen, I would lay the different sets of testicles by themselves outside the water, and put on a glass slide, under a top cover, a specimen from each set, and examine them at different intervals of fifteen minutes to one-half an hour. During the Summer of 1877, I made a number of these experiments, and invariably found the spermatozoa from one set of testicles would outlive the others, and as a rule, those stallions whose testicles showed signs of injury, or inflammatory process showed less vitality; whereas the size of the testicle seemed to make little difference with the vitality of semen, both being healthy. Small or medium sized testicles, as a rule, are less subject to injury, especially in stallions that are tracked or given fast road work. In one case particularly where specimens were examined, the animals having been castrated between eight and nine o'clock in the morning on a moist warm summer day, the specimens were prepared and examined between nine and half past nine in the morning. I had occasion to show these to parties as late as five in the afternoon of the same day, and, to my surprise, the specimen from one set of testicles still showed vitality enough to move, while all the others showed no signs whatever of life.

I am of the belief that under favorable circumstances, if properly prepared, the semen of a stallion can be kept for several days; and that, at some future date, we will be able to send specimens of semen to be injected, instead of mares to be served. This would not only save the expense and time of shipping the mare, but a single service of a valuable stallion could be used to impregnate a number of mares, by which means a stallion could as easily get two hundred colts each season as fifty by ordinary methods.

THE DIFFERENT INSTRUMENTS AND REMEDIES NOW
ADVERTISED FOR BARRENNESS IN MARES.

I present, for your consideration, these instruments, and principles indicating, ideas of greater or less value; but all point towards one great principle—the dilation of the cervix and its retention in that position and centre of canal. To say that any one or all of the instruments can prove successful in every case, is an impossibility, though I am sorry that such advertisements as the following are to be found in our stock papers regarding one of them at least—"Barren mares made to breed regularly. *All mares made to conceive at first service.*" This makes it practically non-professional, and is a poor recommendation for parties who indorse such statements. It may serve a special purpose in certain cases, but it is far from being infallible, and its claim is not only unjust and misleading to breeders but unreasonable and erroneous. The Eureka requires from six to ten hours for expansion, hence the mare must either wait or return for service the next day. It is the most expensive one of the kind in the market as each service requires a new instrument.

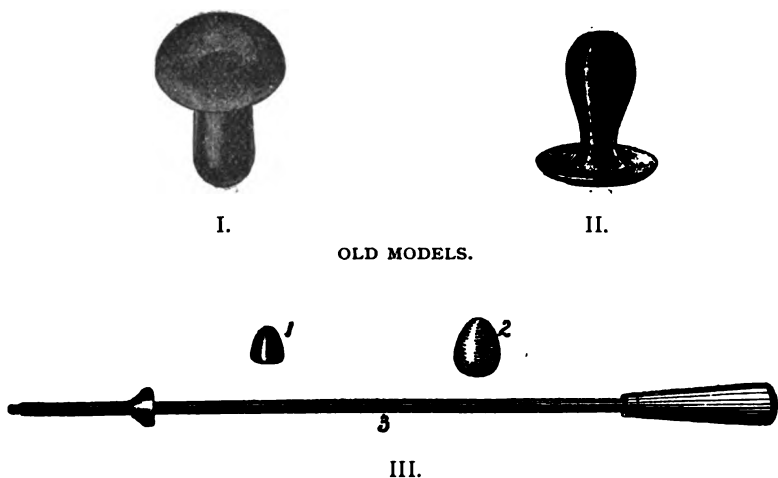
The funnel shape instrument is practically out of use on account of the great difficulty attached in placing it. The exceeding wide spreading end that is intended to pass through the cervix has to be folded or rolled very tightly in order to get it even in a fairly loose os; and in cases that are at all constricted, less than to admit two fingers, it serves little or no purpose. Even should it be crowded into the cervix, it cannot expand, and is either thrown out by the mare, or works out during the act of copulation.

The Meddick pattern consists of a flat disk and a soft rubber tube; the latter surrounded by convolutions or flanges of rubber to retain it in position, and is held in shape by a hard rubber tube, small enough to pass through the others. This is too complicated to be practical, even if the convolutions were not a source of annoyance in removing it from the cervix, and in retaining filth unless *every precaution* in cleansing and disinfecting is followed after each service. Besides, this is a hard rubber tube, when the least projecting, would subject the glans penis to more or less pain (if not injury) in proportion to the closeness of the cover and the ardor and impetuosity of the stallion.

As to medical remedies, those kindly sent by Mr. Wallace Banus for your inspection can not be given a professional standing

on account of the misnomers, under which they are to be recognized; not being represented either in Allopathic or Homœopathic medicines; consequently are shrouded in mystery, which injures their reputation at least from the professional standpoint.

As to my own patterns of Impregnators and Dilators, Figures I, II, III, represent those which have been in general use for several years. The impregnators consist of a hollow tube or cone

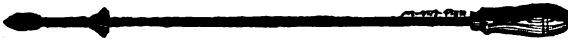
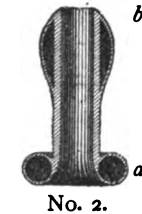


composed of soft rubber of sufficient thickness and firmness to retain its shape and resist the pressure of cervix. Somewhat constricted at the disk portion that it may be self-retaining, the disk on the posterior surface is made so as to correspond to the urethral sinus of the glans, while the opening through the disk is sufficiently large to admit the projecting end of urethral tube. The greatest difficulty is to make the two sizes meet all of the requirements and variations of the cervix, as well as the peculiarities of the stallion, and the idiosyncrasies of the owner or attendant. In certain cases No. I (small size) proves difficult to insert on account of the close tense os, but with the dilator this is quite easily obviated. In other cases No. II (larger size) may be too small to be retained and requires a larger size.

Some stallions are especially sensitive while covering a mare—generally those stallions whose parts are larger than normal or those having a big season, and are not very anxious when they find the least interference. To obviate these difficulties I have to

present you the new models of impregnators and dilaters represented by cuts Nos. 1, 2, section No. 2, No. 3 and No. 4. They consist of the same size tube internally, so that a single dilator fits the entire set, while the external dimensions correspond to the size of the cervix any where from an inch to two and one-fourth inches in diameter and from three and one-half to four and one-half inches in length. By section of No. 2, it will be seen that the disk (a)

NEW MODELS.



No 4.



consists of a hollow air space as well as the bulb (b). The disk closely corresponds to the os in pliability, and the most sensitive stallions should fail to perceive the difference and as a consequence make an equally close cover as when no instrument is used. The advantages in favor of the tubular variety of impregnators, are the close approximation to the normal condition of the cervix during heat, rendering complete—as it does—the communication between vagina and uterus, thus assuring easy access for the seminal fluid, besides being easily inserted and ready for immediate use. They are *cheap* as one *will last for years*, and can be used on any number of cases.

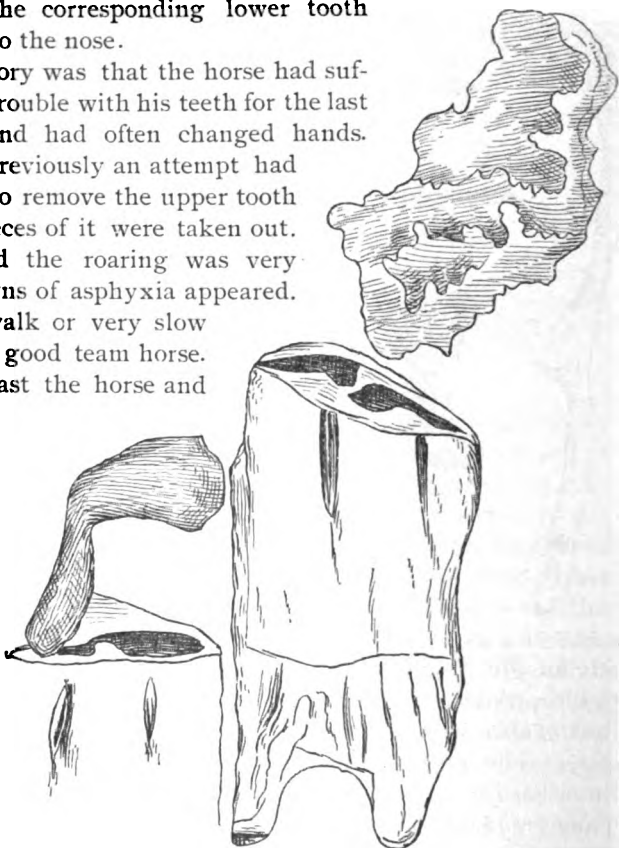
A FISTULOUS OPENING FROM THE MOUTH, RESULT- ING FROM A DISEASED TOOTH.

BY DANIEL D. LEE, M. D. V.,
Instructor in Anatomy,
Veterinary Department, Harvard University.

A bay team horse was brought to me for treatment for roaring. I found the right nasal chamber completely stopped up, the breath very foetid, a slight bony enlargement on the right side of the nasal peak, the first upper molar almost eaten away by decay and the corresponding lower tooth grown up into the nose.

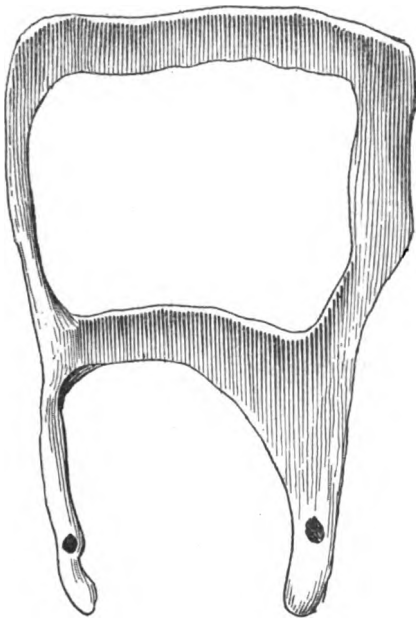
The history was that the horse had suffered from trouble with his teeth for the last four years and had often changed hands. Two years previously an attempt had been made to remove the upper tooth and some pieces of it were taken out. When trotted the roaring was very loud and signs of asphyxia appeared. Used at a walk or very slow trot he was a good team horse. Next day I cast the horse and removed the lower opposing molar which projected one inch beyond the other lower teeth. I then took out two pieces of the upper molar that had been left from the former operation.

One of these pieces was attached to the jaw and the other rode on the crown of the lower molar which



projected up from the others; in this way a large opening had been made in the floor of the nasal fossa. I could get my fingers into this opening from the nostril and from the mouth, and was able to remove about two quarts of grain and hay mixed with blood and pus, all in an advanced state of decomposition.

The opening was irregular, and extended from the second upper molar two inches forward, and laterally a little beyond the median line. Not only was the hard palate worn away, but also the lower end of the turbinated bones, and a small hole could be felt through the nasal septum. The great length of the lower tooth and the food forced into the opening, prevented the unattached piece of the upper molar from falling into the mouth; and having great play it had worn a very large hole.



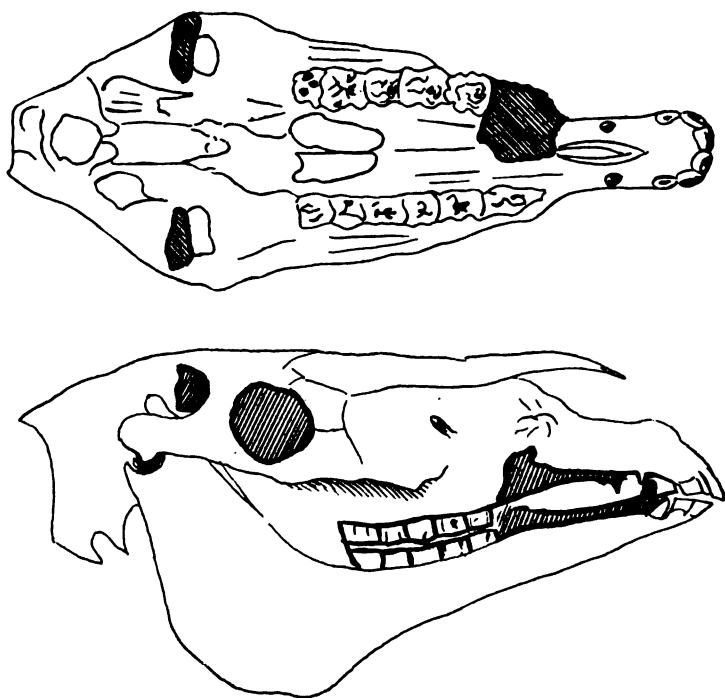
Great relief followed the operation, and a large amount of cheesy matter, rotten hay and grain was snorted out. The removal of this stuff left the hole open and allowed air to pass from the nose to the mouth, so that drinking was impossible, as no vacuum was found in the mouth by depressing the tip of the tongue. Twice a day a plug of oakum was put in the opening, the horse in a few days holding his mouth

open for this to be done. Food was swallowed without any trouble. After the first week the frightful smell, always present in such cases, passed entirely away, and the hole began to slowly fill up. The horse was then put to work; after three months the hole seemed to have stopped growing smaller, so I consulted with my dentist, Dr. H. H. Gage, who volunteered to make a cast of the mouth and make a silver plate to be fastened to the second molar by a pivot. We cast the horse and after one or two trials Dr. Gage was able to get an exact plastic cast of the hole and

surrounding tissues. From this he made a metal cast on which he beat out the silver plate, a drawing of which is given above.

After the plate was finished we cast the horse and found that as far as it went the plate was perfect, but that the drilling of the second upper molar for the rivet was very hard. However, after making a small incision in the cheek in which we put a short tube to keep the tissues off the twist drill, we went to work. Seven steel twist-drills were broken, two of them remaining in the tooth, so we had to abandon our attempts. During the operation the horse felt no pain, as all the projecting part of the teeth is solid, the pulp cavity being ossified. A few days after this the horse had a severe nose bleed while plowing, and thinking that he had done enough in this world, I sent him to the next.

Below are two views of his skull, the opening being shown in each in black; they give a better idea of the condition than a written description.



I know of one similar case where death resulted from inability to swallow after removal of a tooth that projected up into the

nose, but bony disease was also present and almost the whole palate eaten away. I have also heard of two cases of openings from mouth to nose after removal of diseased upper molars, but they were small and soon filled up. The same condition is sometimes seen in young animals, in whom the closure of the suture of the palate is not complete ; in these cases the greater part of the milk taken from the mother is lost from imperfect deglutition. If I ever meet with a similar case I hope to be able to insert a plate successfully.

I think this can be done *provided* no disease involving the bone cause the trouble with the teeth. I have two skulls, in the museum of the Veterinary School, where the teeth have been lost from cancerous disease which involved the bones of the upper jaw. Such cases are of course hopeless.

MEASLES IN HORSES.

SAME.

I have seen a number of horses, within the last two weeks, all of which were kept in the same stable. These horses were sick on an average about five days.

For the first two or three days they were feverish, refused to eat, had eyes very much inflamed, some sore throat and nasal discharge. The skin was very hot and tender, and about the third day an eruption like that seen in surfeit appeared on the skin. After this their appetite at once returned and all the other symptoms disappeared.

I thought the attack one of "pink eye," but the entire absence of any complications, and the fact that there was no prostration of strength, such as we have in most influenza cases, together with the eruption made me think differently.

No cases as yet have been seen outside this particular stable; this does not look like influenza. I find no treatment other than the removal of the grain is necessary. There have been about eighteen cases, nearly all of them acclimated horses.

IDENTIFICATION OF ANIMALS.*

BY R. S. HUIDEKOPER, M.D., VETERINARIAN.

There is perhaps no part of veterinary practice or animal commerce, in which there is a greater want of method, laxness in detail, and carelessness in recording, than in the description of the subjects handled, and in the noting of points, which will establish the future identification of an animal. For the ordinary layman an equine is a horse or a mule, a bovine a cow, and a canine a dog, irrespective of age, color, sex, or condition of servitude. A stallion is a rarity, a steer is a beef animal, and by many a bitch, bull, or gelding, is not considered as mentionable in polite society. This inattention to definite terms leads not only to vagueness in veterinary writings, but also frequently causes the writer to commit errors in English, which could have been avoided, by a definite fixation of the subject matter.

In the description of an animal for veterinary purposes, whether in an expert examination for soundness, in judging, or in a legal controversy, or in a clinical description, or for registration in a stud-book, a definite course of examination and a methodical system of recording should be observed. If this is done, and the written description follows the same form in every case, it educates the observer to note the small, and sometimes apparently trivial differences, which at times are the important points upon which an identification is based.

The table below outlines the course to be followed in an ordinary record of the identification of an animal :

I. DESCRIPTION OF ANIMAL. *a*, Species of animal, race, family; *b*, Sex; *c*, Age; *d*, Height and weight; *e*, Color; *f*, Accidental markings.

II. DESCRIPTION OF ABNORMAL OR PATHOLOGICAL ALTERATIONS.

With the domesticated animal custom has established certain specific terms which define species, sex and age, and these should be used according to their exact meaning, and with no other meaning so far as possible, in all expert writings.

GENUS *EQUUS*; *Species caballus*. Specific term, Horse. The animal is—a *Foal*, irrespective of sex, from birth until weaned; a *Weanling*, when weaned until it becomes a *Yearling*. The male

* Read before the United States Veterinary Medical Association, at Washington, Sept. 16th.

animal is—a *Colt*, until the mouth is made, or until castrated; custom has, however, accepted the first indication of the corner teeth or four years, as the age at which he becomes a horse; a *Gelding*, after castration, at any age; a *Horse* or *Stallion* after the the mouth is made, or earlier, if he stands for service; a *Ridgling*, if one testicle has not descended to the scrotum. The female is—a *Filly*, until the mouth is made or, until bred; a *Mare*, after the mouth is made, or sooner if bred.

Species asinus. Specific term, Ass. The ass is—a *Foal*, until weaned; after that the male animal is a *Jack*; the female animal is a *Jenny*. The male mule is known as a *Jack Mule*, irrespective of gelding, and the female as a *Jenny Mule*. The hybrid foal of the male ass and the mare is the true mule. That between the stallion and the female ass is called the *Hinny*.

GENUS BOS; *Species domesticus*. Specific term, Neat Cattle. The animal is—a *Calf* until six months old (the natural time for weaning); a *Bullock* is a young bull, or any male of the ox kind; a *Bull* is the male animal; a “*Steer* is the castrated male of neat cattle. He is called an ox calf, or bull calf, until he is twelve months old, a steer until he is four years old, and after that an ox or bullock,” *Youatt*; an *Ox* (*vide*) “steer”; a *Stag* is a castrated male; a *Heifer* is the female until bred, or until the mouth is made; a *Cow* is the female after breeding, or when the mouth is made.

GENUS OVIS; *Species aries* Specific term, Sheep. The animal is—a *Lamb* until a year old; a *Ram* or a *Tup*, when male over eighteen months old, and has its first intermediate permanent teeth; a *Ewe* when female over eighteen months old, and has its first intermediate teeth; a *Wether*, when a castrated male; a *Hog-Hogget* is the young sheep before it has been shorn.

GENUS CAPRA; *Species hircus*. Specific term. Goat. The animal is—a *Kid*, until a year old; a *Billy* is the male; a *Nanny* is the female.

GENUS SUS; *Species scrofa*. Specific term, Swine, Pigs, Hogs. The animal is—a *Suckling* until weaned; a *Roaster*, from four until eight weeks old; a *Pig* until a year old, male or female; a *Porker*, *Porket*, or *Porkling* is a young hog or pig; a *Boar* is the adult male; a *Sow*, the adult female; a *Shoat*, *Shote* or *Shoot* is a growing hog; a *Barrow* is a castrated hog; a *Farrow* is a litter of pigs..

GENUS CANIS; *Species domesticus*. Specific term, Dog. A *Puppy* is—the young; a *Dog* is the male; a *Bitch* or *Slut*, the female, (the former term is preferable).

GENUS GALLUS; *Species domesticus*. Specific term, Chickens, Barnyard Fowls, Pullail. A *Cock* is the male; a *Cockerel* is a young cock; a *Stag* is a young game cock; a *Capon* is a castrated male; a *Hen* is the female; a *Pullet* is the young female; *Poultry* are the fowls fed for the table.

AGE. Beyond the definitions made by the specific terms just mentioned, the question of age is too long a subject to enter into in a paper of this kind, and is also one which has been made the subject of such minute study and description in numerous writings, that they can be referred to, for accuracy.

HEIGHT. The horse varies from 9 hands to 22 hands in height; under 14 hands he is known as a pony; cobs measure from 14 to 15½ hands. Some of the great Belgian and English draft horses reach 18 hands or even more. Barnum showed, a few years ago, an ungainly broken-kneed bay coach-bred gelding, that measured 22 hands. On a written certificate the heights should be given as under standard (S) or estimated (E). The height is taken at the highest bony point of the withers, the spinous process of the seventh dorsal vertebra. Care should be taken to see that the horse being measured is standing on an exact level with the examiner, and with the instrument used. The ordinary form of instrument used is the *standard*, a rod six feet in height with a movable cross bar, the latter usually fitted with a spirit level. Care should be taken to see that the upright is perfectly vertical, as a small inclination will make an important difference in the horizontal bar. When there is a decided difference in the height of the withers and croup, as sometimes occurs, it should be noted, but the record is taken from the former. It must be remembered that in double teams, the form and style in carrying the head will frequently render two horses a good match, when the standard shows a decided difference in their height.

WEIGHT. The question of weight, in the description of horses, is a custom almost exclusively American. The average weight of an ordinary horse is about 1000 lbs.

Ponies are under,	- - - - -	800 lbs.
Light roadsters,	- - - - -	950 "
Ordinary roadsters and saddle horses,	- - - - -	950 " to 1150 lbs.
Coach horses,	- - - - -	1000 " " 1350 "
Light draft horses,	- - - - -	1000 " " 1350 "
Medium draft horses,	- - - - -	1350 " " 1500 "
Heavy draft horses,	- - - - -	1500 " and over.

With a severe fever or other illness a horse may loose 25 lbs. to 40 lbs. a day, 200 lbs. in a week.

COLOR. The "coat" of animals is made by an ensemblage of the color of the skin itself (epidermic pigment), the character and color of the hairs, and the products of secretion and excretion of the glands of the skin (sebaceous and sudoriparous glands).

In wild animals the coat is almost invariably distinctive of the species of animal, although varying frequently, somewhat with the age of the animal, and with the sex. In all animals the hairs are generally coarser and longer over the neck and withers in the male than in the female; and the color of the former is, in most species, darker and more pronounced than in the latter. But while wild animals have usually a uniform color, domesticated animals, and many wild ones, which have been bred in captivity, are subject to great variation in color, and their coats are subject to the introduction of white, which is rare in wild animals.

THE SKIN. The skin may be pigmented throughout with a deposit of a leaden or brick dust color, which may even extend to the mucous membrane of the nostrils, tongue and hard palate, or the pigment may be entirely absent, or may be absent only from certain parts; in the latter case, it is usually absent from the neighborhood of the natural openings, the lips, the eyelids, the genitals and the anus, and from the extremities, pasterns, fetlocks, legs, and face.

THE HAIRS. *Character.* The hairs are of two sorts; the hairs proper, which cover the surface of the body, and are short, fine and soft, and lie closely together in a definite direction, for each given part of the body. These are shed annually or oftener. The longer coarser hairs, which, under the name of mane, forelock tail, tentacles, eyelashes, moustaches, and whiskers, grow from the crest of the neck, the tail, the eyelids and the lips, and on the fetlocks of coarse bred animals, are persistent. The hairs of the hog are always coarse and are called bristles, and those of the sheep, of great fineness and crinkled, are known as wool; both of these terms are used for the hair of the other animals, when, in its texture, it resembles them.

Color. The colors of animals are not as brilliant as those of a flower or of the plumage of birds, but we can recognize that, like these, they are based upon the primitive colors of the prism, red, blue, and yellow. In the horse we have as primitive colors a modification of—*Red*, bay and chestnut; *Blue*, steel-grays and mouse color; and, *Yellow*, duns; *White*, absence of all colors, and, *Black*,

presence of all colors. From modifications in the shades and tints of these, and from combinations of them we have the colors of the coats. Professor Neuman divides the coats into three categories : 1, *Primitive coats*; 2, *Derived coats*; and 3, *Conjoined coats*.

Primitive coats, are those which the animal has at birth. *Derived coats*, are those which appear after birth, and are due to the introduction of white. *Conjoined coats*, are those in which there is the presence in the same animal of two coats, primitive or derived.

1. *Primitive coats*. Form three groups : A. *Simple coats*, with but one single color, as black or sorrel. B. *Composite coats*, formed of hairs of two colors, black for the mane, tail and extremities, and yellowish, reddish or bluish, for the body, as the dun, bay or mouse color. C. *Mixed coats*, are made of hairs composed of two colors, usually yellow at the base and black on the end; this is a rare color, and when it exists in the horse, is often improperly confounded with the roans.

A. *Simple coats*. The simple coats are those made of hairs of but one color, the *Black*, *Sorrel* or *Chestnut*; Goubaux and Barrier exclude the *White* as a color, as in the so-called white horse there is invariably more or less trace of black or other color making it a very light gray. If it can be shown that absolutely white (not albino) horses exist, then, white can be included as a simple coat.

a. *Black*. The black may be a dull, uniform, dead black, without any reflecting tints, or the latter may be so marked in reddish or yellowish hues as to confound the coat with that of a brown bay. It may have the brilliant reflection of jet.

b. *Chestnut* or *Sorrel*.* This is a yellowish or brownish red, which comprises many shades. Commencing with the lightest in colors there is : 1. The *Cream color*, which may be subdivided, as light, ordinary or dark; 2. The *Light sorrel*, has a decidedly yellowish tint, like the coat of the lion. An ordinary chestnut turned to pasture for a month, will sunburn into this color; 3, *Sorrel* or *chestnut* (ordinary) is a cinnamon color, the hairs of mane, tail and legs, must have the same color as those of the body; 4, *Washed sorrel*, is a degenerate light sorrel, but the legs, mane and tail are very light or almost white; 5, *Dark sorrel*, is a brownish cinnamon color; 6, *Cherry sorrel*, has a decided bright red tint; 7, *Chestnut* (proper) is a rich uniform brownish red, like that of a ripe

* These terms are used as synonymous.

chestnut; 8, *Burnt sorrel*, is a dark rich brown, like roasted coffee. Horses of this color invariably have more or less white hairs sprinkled over the body, and a mane and tail of almost a white or silver color. According to the reflection of the tints of a sorrel, it may be golden, fox (copper), or bronze. White marks on the head and legs of sorrels are common.

B. *Composite coats*. Composite coats are those with two distinct colors, a reddish, yellowish or bluish one for the body, and black for the mane, tail and legs; they are the *dun*, *bay* and *mouse* color.

a. *Dun*. The dun has yellowish hairs over the body, to the knee and hock and over more or less of the face. The mane, tail, and hairs on the cannon and fetlocks are black. A dun may be *light*, *ordinary* or *dark*, in the latter case taking the name of *Buckskin*. Duns frequently have a black line running along the centre of the back, the black cross of the ass on the withers, and the transverse black marking of the Zebra on the legs. The light dun is sometimes almost the same as a *cream color*, but can always be distinguished from it by the presence of black on the extremities. The dun is known in French as an *Isabelle*; according to Bouillet, *Dictionnaire d'Histoire et de Géographie*, the Archduchess Isabelle of Austria, daughter of Philip II of Spain and and ruler of the Netherlands, accompanied her husband at the siege of Ostend, and made a vow not to change her linen before the conquest of the place. The siege lasted from 1601 to 1604, and the color of the chemise of the Princess gave origin to the name.

b. *Bay*. In the bay the color of the body is a red, which may vary from a cherry to a mahogany, and is distinguished from any similar shade of sorrel, by the presence of the black mane, tail, and legs, although in the last the black may be reduced to a narrow circle of black hairs around the coronary band. The *Bays* are: 1. *Light Bay*, these frequently have the black cross and zebra stripes on the withers and fore legs; 2. *Bay* (ordinary) distinctly red; 3. *Blood Bay* (mahogany) darker; 5. *Dark Bay* approaching brown; 5. *Brown Bay* or *Brown*; becomes nearly black in Winter, but always has a reddish tint around the muzzle, armpits, belly, flanks and thighs, while the sunburnt *black*, in Summer, is black in the same places.

White markings on bays are usually less frequent and less extensive than on sorrels.

c. *Mouse color*. The mouse color is less frequent in the horse than in the ass and mule. It is an ashy blue over the body, while the mane, tail and legs of the animal are black. It is frequently accompanied by the black cross and zebra stripes.

C. *Mixed coats*. This is a rare color, composed of hairs which are yellow at the base and dark at the tips, like those of wolves, and some wild animals. It is probably usually confused with the roans, but should not be.

2. *Derived Coats*. Derived coats are those due to the introduction of white into the primitive coat at some period after birth; they are the *Grays* (including white) and *Roans*.

A. *Gray*. Goubaux and Barrier say: "Classically, gray "is a mixture of white and black hairs. Practically, it is far from "being so. Take by chance ten gray horses, and it is readily "seen that this definition is not sufficient. The dark hairs *are* "not always black. They are often brown, chestnut or reddish "(bay), more rarely yellow. The *White* hairs are sometimes "washed yellow." Brivet says: "The gray coat is excessively "variable in tint; it is a sort of chaos, mixed with hairs of "different shades."

The gray is a mixture of light and dark hairs over, not only the body, but also in the mane, tail and legs; it can have for basement color, black, bay, sorrel or dun. A gray may be: 1. *Very little gray*, showing only a few dark hairs, usually called white; 2. *Light gray*, with more dark hairs, especially on mane, tail and legs; 3. *Gray* (ordinary), with about an equal mixture of white and black hairs; 4. *Dark gray*, with a predominance of dark hairs; 4. *Iron gray* (steel), with a bluish tinge, like that of a freshly broken piece of steel; (a darker shade might be called *slate colored*;) 6. Grays can further be distinctly characterized as *Dirty*, *Dun* or *Roan* grays.

Grays usually become lighter as the animals become older, so that at different ages the same animal would need an altered description. The *White* if recognized as a coat, or in the ordinary case, when it is a coat derived with age, from the grays, is *milk*, *china* (bluish), *dirty* or *rose* white; these qualifications indicate the tint given to the white, without further explanation.

The *Strawberry roan* (or *Peach*) is a sorrel, with numerous white hairs in body, mane and tail; it may be light or dark. A *strawberry roan* is always much lighter after clipping.

B. *Roan*. The roan has a coat with three colors of hairs, black,

reddish and white, that is a body with numerous white hairs over the body. It may be *light*, *medium* or *dark*. According to the color of the hairs which predominate and the distinctive tint of the roan, it may be further qualified as a *blue* roan, a *red* roan (not to be confounded with *strawberry* roan, white and chestnut), a *white* roan, etc.

3. *Conjoined Coats* are those in which the same animal has two or more distinct primitive or derived coats on different parts of the body. They are represented by the *Piebald* or *Skewbald* which has a mixture of large white patches with other colors. The piebald strictly is a mixture of white and black, like the magpie from which it takes its name, but by custom includes the others; "*pie*" refers to the white; for more definite description, we may consider: a *pied-black*, a *pied-sorrel*, a *pied-bay*, a *pied-roan* or a *pied-gray* as a black, sorrel, bay, roan or gray with larger patches of white than of the dark color, while a *black-pie*, a *sorrel-pie*, a *bay-pie*, a *roan-pie* or a *gray-pie* is one in which the white is of less extent. We may also describe the horse as being *pied*, on near or off, belly, side, withers, or wherever the white may be. The color of the mane and tail should be indicated if the *pie* is a mixed one.

In rare cases there are horses, with conjoined coats of black and bay, two colors of bay, dun and gray, etc. These may be indicated by special description as *pied* of such and such color.

Spotted (Tiger spots). Spotted horses are found, especially in Denmark and from the valley of the Danube, and in the United States from Virginia and Michigan, which can be described as of such or such a color, spotted with such or such a color, the size of spots and location to be given.

SPECIAL MARKINGS. In addition to the color of the coat, it may have peculiar growth of the hair, tints, or discolouration, which give it a characteristic effect, and serve to identify the animal.

They may be divided into: 1. *General Markings*; 2. *Markings of the head*; 3. *Markings of the body*; 4. *Markings of the legs*;

General Markings comprise reflection of color, dark hairs, white hairs, black hairs, reddish hairs, cowlicks, and discoloration of the skin.

Reflection of color may be called: *Jet*, if a brilliant black; *Silvery*, if a bluish, porcelain white; *Golden*, for rich sorrels, bays

and duns; *Bronzed*, for metallic reds and browns; *Watered*, when presenting alternate shades or undulations of color.

Darker hairs:—*Dapples* are spots usually the size of a silver dollar composed of darker more brilliant colors, than those of the rest of the body.

White hairs:—*Absence* of white hairs defines a horse as *solid* in color; *Scattered* white hairs, when not of sufficient number to make a derived coat, should be noted; *Fringed*, is a mixture of white hairs and those of the coat of the animal surrounding a circumscribed white spot.

Careful attention should be given, to noting the difference of natural white markings and not to confound them with *Accidental white*, which is the result of wounds, accidental scars, rubbing of harness or saddle, and blisters.

Black hairs:—*Fly Specked* is said of small spots or black hairs, seen most frequently in grays, sometimes in chestnuts, bays and duns; *Ermined* is the presence of larger spots of black, occurring most frequently in or along the borders of white markings; *Burnt* is the black shading of various coats, most commonly seen in sorrels.

Red hairs:—*Flea Bitten* is said of small spots of red hairs over the body and more frequently on the head and face, this is most frequently seen in old grays; *Sun burnt* is the reddish hue often seen in blacks; *Roan* (adjective) is the qualification used when reddish hairs appear over a gray, as *roan gray*.

Direction of hairs:—*Cowlicks*. Cowlicks are hairs running in irregular directions from, or to, a given point; if the first they are eccentric, if the second concentric. They occur on all horses in the centre of the forehead, on the breasts, and on the flank. They may occur at other parts of the body, and should then be noted marking the size of the cowlick and direction of the hairs. They are apt to occur in rich colored coats, and are often very distinctive of family. The trotting horse *Commonsense* is peculiarly marked with them. The Arabs consider them a mark of great quality. *Feathered* is the term used when the divergence or convergence of hairs takes place from an elongated centre.

Discoloration of the hairs or skin:—*Washed* is the term given to the faded tint seen with many coats. In bays it is found in the light or yellow colored legs; it is frequent on the legs of sorrels. *Leprous spots* denote the absence of pigment from the skin in spots or patches of variable size. They are frequent on the

genitals and lips, often occur on the eyelids, anus, and under the white hairs on the extremities, and may be found on any part of the body. If these patches have spots of pigment in them, they are termed *Marbled*. Geoffroy St. Hilaire, Curnieu and Goubaux have noted horses entirely denuded of hair.

PECULIARITIES OF THE HEAD. White may be present in variable extent, but is usually in more or less definite form and takes with each a specific name.

A Star is where the hairs make an eccentric cowlick, running in all directions; *A Flame* is where they run in one direction from a cowlick, and the direction should be noted as to right or left or if in the rare direction downwards; *A Shield* is in the form indicated by the name; *A Crescent* (quarter moon) faces up or down, to right or to left and should be so noted; *A Blaze* is a white stripe down the face, it may be to right or left, may commence above with a star and may terminate below with a white nose or with leprous markings; *A Snip* is a little stripe of white on the nose; *Bald Face* is where the whole face is white.

Any of these markings may be ermined or fringed. The face may be fly-specked, or flea-bitten.

Moustaches or excessive growth of rather coarse hairs are at times seen in the upper lip of horses, especially those with Irish and Breton blood, from Vermont and Canada, Hackneys, etc.

Grays, roans and duns have at times very dark, almost black faces, which are characteristic.

Wall Eyed is applied to eyes in which the dark pigment of the iris is replaced by a light gray or bluish white. It may be complete or incomplete, and may affect only one or both eyes.

Brivet says that wall eyed horses do not see well in the dark. The ordinary pigment of the eyes is sometimes replaced, in one or both, by a tawney yellow or wine color.

MARKINGS ON THE BODY:—*Mule Stripe* is a black or dark red stripe extending on the median line from the withers to the base of the tail; *The Cross* is a stripe at right angles to the Mule Stripe from the withers down the shoulder; *White or Washed Hairs* may occur in patches over the body; *Zebra Stripes* are transverse black bands, seen usually on the upper arm, sometimes as low as the knee.

MARKINGS OF THE LEGS.—White on the extremities is described as "white," "coronary," etc.; "pastern" or "fetlock" when it

simply surrounds the coronary band, covers the pastern or reaches the fetlock ; *A Stocking* is white reaching to the knee or hock ; *A Half Stocking* reaches half way up the cannon. These white markings may be *incomplete* (internal or external), *fringed*, *ermined*, *flea bitten*, etc. When white occurs on one leg only, the leg is indicated. When on two, they are defined as anterior biped, posterior biped or diagonal biped (left or right), according to the fore leg of the diagonal. When three legs are white, they are described white *except* the odd leg.

Identification may be made more complete by indicating the complete or partial want of pigment in any of the hoofs.

ABSCESS OF GUTTERAL POUCH.*

BY W. H. RIDGE, V.M.D.

Bay mare, six years old, well bred, weight about nine hundred and twenty-five pounds, served by Epaulet, September 23d, 1890. Taken sick August 3d, with symptoms of pharyngitis ; another mare taken with similar symptoms recovered in two days. The symptoms were severe chills, weather was warm, it took two heavy blankets on her before she stopped shaking ; I found after the chill the head lowered, nose out straight, champing the jaws continually (which lasted at intervals throughout her sickness), seemed anxious to eat, would chew the food, then quid it ; fluids, when swallowed, would be returned by nostrils, a gulping sound was produced when swallowing, then would cough ; the cough was moist and with rapel, she had a slight foamy discharge from nostril, the temperature was 103° F., which gradually lowered to normal on the 10th, to rise to 103° on the 22d, after a severe hemorrhage. Respirations were normal until the 25th, when they began to increase in frequency ; on 16th she had a free discharge of a stringy fetid mucus, the breath was very foetid after this until death. There were no swellings over the guttural pouches or any part. No dyspnoea at any time. Vesicular murmur over both lungs. No points of dullness on percussion ; on turning did not show any stiffness except head and neck ; pulse was normal,

* Read before the Pennsylvania Veterinary Medical Association.

full, and strong, and not above forty-five until after the hemorrhage when it rose to ninety. Mucous membranes were rosy hue until after the hemorrhage, when they became pale. Bowels were normal; urine appeared normal.

My diagnosis was at first pharyngitis; later, post-pharyngeal abscess. The mare was at first treated by heart sedatives, with Potass. Nit. in drinking water, followed in a few days by Hyd. Bell. Iod. blister to throat, and internal treatment of tonics, Dig., Acid Sulph., Potass. Iod. Dr. Rayner was called on the 14th. He found great tenderness over the third cervical vertebra, which he thought was due to an injury. Then we blistered the neck, and used hot packs. On the 16th she discharged about one pint of a stringy, foetid substance from the nostrils, as if it came from some cavity; after this we had a frothy discharge as before, except that it now remained foetid. We now added Ferri. Sulph. to our treatment. On the 17th Dr. Rayner again saw her, when he confirmed my diagnosis of post-pharyngeal abscess, with a good prognosis. Temperature, now, 100.1° ; pulse, forty-two; respiration, fourteen; and eating three pints of oats besides oat meal gruel, and also grass and apples. But yet the head was held stiff as in poll evil, and if we attempted to move the head it gave her great pain. This condition lasted without change until the 21st when, in the night, she commenced with a violent hemorrhage, bleeding fully six quarts. When I arrived it had nearly stopped, but was flowing from nostrils and mouth, the mouth champing. The discharge was without cough, and did not discommode her as she would offer to eat while bleeding; the blood was pure blood and without foam. Gave her Ext. Ergot when the hemorrhage stopped; in about one hour she commenced coughing and sneezing, when the hemorrhage again commenced. We administered Morphia and Canabis Indica, followed by Ext. Ergot, fl. 3 iii every twenty minutes until she took 3 iii; when she had no more hemorrhage. Next morning gave her whiskey, milk and eggs, also Tinc. Bell., Cinchona Sulp., and Spts. Nits., emulsion. The next morning, the 22nd, Dr. Rayner again saw her when he approved of my treatment. The temperature now rose to 103° ; respiration remained fifteen; pulse ninety, and weak but regular.

The prognosis was now grave, as the mare refused to take any nourishment. On the 23d she began to take gruel but with much more difficulty in swallowing it. Temperature rose to 104° ; respiration normal; pulse eighty-four, weak. On

the 24th Dr. Rayner again saw the mare ; he thought it best to swab her throat out with a solution of Ferri. Sulph., which was done. Temperature 103° ; pulse eighty ; respiration fourteen. On the 25th, temperature 102.8 in vagina ; respiration eighteen ; pulse ninety ; not eating, eye looked dull, countenance haggard, nose straight out, head in corner, legs cold, rectum patulous. Examined lungs, did not feel sure as to their condition. I also thought there was trouble in guttural pouch and wanted to perform hyo-vertebrotomy ; but, wishing advice, sent for Dr. Zuill, who found a small patch of pneumonia in right lung, and as he did not think there was anything wrong with the guttural pouches, did not approve of operation. Applied blister to right side of chest ; the left lung seemed all right. The prognosis was now more grave, as the mare had not enough strength to stand much of a pneumonia. On the 26th the temperature was 102.2 in vagina ; respiration twenty-nine ; pulse ninety-five, weak but regular ; eyes sunken, mucous membrane dry, legs cold, crepitant, rales in middle and upper part of right lung ; while we had mucous and blowing rales in the bottom, we now had crepitant rales in the left lung at the bottom. She stands in one place with the head in corner ; breath same fœtor, but more so when disturbed.

On the evening of 28th, the mare died. Autopsy 10 : 30 A. M. next day. Temperature of weather, 80° in shade. Animal lying on left side ; emaciated, but not tympanitic. The animal evidently had not struggled lying on peat moss. No discharge of fluids from any opening. Made incisions along the linea alba from pubis to submaxillary space, skinned down the neck, then sawed off inferior maxillary bone anterior to molars, disarticulated, and dissected down to guttural pouch. Parotid and submaxillary salivary glands normal ; opened right guttural pouch, which was perfectly healthy ; then opened larynx, which had a few minute points of inflammation. On opening the pharynx found the mucous membrane inflamed and points of ulceration ; the teeth were stained black, and tongue normal. On opening the left guttural pouch we found it about half full of cheesy fœtid pus and decomposed blood clot, and extensive ulcerated condition of the mucous membrane. The hyoid bone was ulcerated until it was disarticulated at its upper extremity ; the ulceration extended through the occipito-atloid articulation. The cartilage of the occipital and atlas highly inflamed and ulcerated. The ulcerations had extended into the spinal canal, the fluid pushing the meninges from the bone. The sinuses were healthy. The third cervical

was perfectly healthy, as well as the muscles over-lying it. Skined down the side, taking off the front leg with the skin, cutting the ribs top and bottom, leaving lungs exposed; cavity contained but very little fluid which was not foetid. The pleura inflamed over the spots of pneumonia, bottom part of right lung; also anterior lobes becoming gangrenous, with pneumonia extending to middle. On section showed points of breaking down; left lung, hypostatic congestion with a commencing pneumonia in the lower part, with anterior lobes breaking down. Pericardium slightly inflamed; endocardium normal; chicken-fat clot in heart and aorta. Abdomen normal but pale; anæmic.

It is a question as to what caused the pneumonia and how long the anterior lobes could have been affected. Also, what was the primary trouble, whether due to injury breaking the hyoid, or pharyngitis ulcerating up the eustachian tube. Whether the pneumonia could be caused by Ergot constricting the vessels to such an extent as to produce gangrene; or, whether due to entrance of blood, producing traumatic pneumonia.

AGE OF THE SHEEP AND GOAT.*

The sheep is of value for any purpose for a still more limited period than the ox, and its exact age is of less importance, except in the case of valuable breeding animals, which are always possessed of a registered pedigree which guarantees the day of their birth. An approximation within a month or two is sufficient for practical purposes in a spring lamb, and an error of six months will not alter the taste of a four-year-old South-down wether for a roast saddle. After this time it is a poor economist, except in districts where wool is the only product to be derived from the sheep, who will not turn it over to the butcher,— again excepting the pedigreed breeding animal. Civilization, better agriculture, and the care of man have altered the physiological characters of the ovine races even more than they have those of the bovine, and a larger percentage of the former have been rendered precocious than of any other species of animal. As a result of the improved agricultural needs, the sheep has altered considerably in form; the eruption of the teeth is more hasty, the

* From advance sheets of *AGE of the DOMESTIC ANIMALS*, by R. S. Huidekoper, M. D. Vet.

horns have diminished in size or are absent, and the general shape of the animal has been modified.

The age of the sheep is determined by the character of the teeth, and of the horns, when the latter are present:

DENTITION.

Formula	{	Temporary,	$\frac{0 \cdot 0 \cdot 3}{4 \cdot 0 \cdot 3} = 20$
		Permanent,	$\frac{0 \cdot 0 \cdot 6}{4 \cdot 0 \cdot 6} = 32$

The sheep has thirty-two teeth like the ox, eight incisors in the lower jaw, none in the upper, six molars in each arch of either jaw, making twenty-four molars in all, and no tushes.

There sometimes exist small supplementary premolars.

INCISORS.—The incisors are eight in number. They are set firmly in their alveolar cavities in the maxilla, and form an arch more convex than either the incisive arch of the horse or the ox. As in the ox, they are termed the *pincher*, *first intermediate*, *second intermediate*, and *corner* teeth. As in the other animals, there are two sets, the *temporary* incisors and the *permanent* incisors. The temporary incisors are much smaller and proportionately much narrower than the permanent ones; so that the jaw of the lamb has an elongated, narrow appearance, which alters greatly in form, becoming wider and more flat, in the older animals. The incisors of both dentitions are wedge-shaped like the permanent incisors of the horse. They have no neck separating the crown from the root, like the incisors of the ox and the temporary incisors of the horse. They are firmly imbedded in their alveolar cavities, which allows them to nip the short grass close to the roots, and obtain a living, where the ox, with its loose incisors, can no longer obtain a hold to tear up the blades. In the virgin tooth the external face is white and polished except near the root, where it is surrounded by a black cement. The internal face has two longitudinal gutters divided by a little crest. The former are filled with black cement. They represent by their convex anterior face, in profile, the quarter of a circle. From this position they meet the cushion of the upper jaw by their free extremity, like the incisors of a young horse, and not by the posterior surface, as in the ox; so that by use they rapidly wear the anterior border and form a table to the teeth like the soliped, and not like that of their closer relation, the large ruminant. The

incisors of the sheep are formed of dentine, surrounding a pulp-cavity which becomes filled with a darker-colored deposit at an early period, and are covered with a layer of enamel, which disappears toward the roots, and which is covered on the sides, in the longitudinal gutters, and near the gums by a black cement.

MOLARS.—The molars, except for their smaller size, resemble those of the ox. They gradually increase in size from the first to the sixth molar, the first three occupying but a third of the arch. The relative density of the dentine and the convoluted enamel differs greatly, so that the dentine is more rapidly worn and the enamel stands in sharp ridges from the table of the teeth.

ERUPTION OF THE TEMPORARY TEETH.

INCISORS.—Considerable diversity of description is found among the older writers as to the time of eruption of the teeth in the sheep from the fact that some studied them in the common races of Central Europe, while others examined them only in the perfected races of England. At the present day the studies of the latter will be found more accurate, as few flocks can be found which are not well bred or mixed more or less with the finer races.

At birth, the lamb may have the pinchers and first intermediate teeth through the gums, or the anterior borders of these teeth may show a whitish line where they press against the gum, which they pierce in from three to five days. The second intermediate emerges from the gum about the tenth day, and is followed tardily by the corner teeth, which do not appear until the twenty-eighth or thirtieth day.

MOLARS.—The three temporary molars in each arch appear about the third week, when we find the first six incisors sufficiently advanced from the gums to allow the young animal to nip herbage, which is to be ground by larger teeth.

ALTERATIONS DURING THE FIRST YEAR.

One to Three Months.—During this time there is little change in the teeth. They are slightly more prominent, but retain their virgin appearance.

About Three Months.—Sometimes just before and sometimes just after three months from the birth of the animal the fourth (first permanent) molar appears, that of the lower jaw preceding that of the upper by a week or more.

Three to Nine Months.—During this half year no characters of substantial value can be found. The incisors during this period attain their full size, and, according to the herbage or other

food on which the animal has been fed, more or less wearing of the anterior borders of the teeth has taken place. In addition, however, to the general aspect of the animal, it is easy to recognize the difference between the fresher teeth, which have scarcely been worn, of a lamb four to five months of age, and the worn, broken, and loosening ones at eight, nine, or ten months.

Nine Months.—At nine months the fifth (second permanent) molar makes its eruption. This fixes an important land-mark in the determination of the age of the young animal.

The fourth and fifth molars are formed of two principal lobes, each with two points of enamel, so that there are four points of enamel; the internal points are higher on the lower teeth, while the external ones are longer on the upper teeth. These points become used, and as they are worn away the band of central enamel is separated from the outer border of the teeth by a larger area of dentine.

The character of the points of enamel on these teeth, or the distance of the bands of enamel from the outer border of the teeth, thus indicates whether the animal has just passed nine months or is a year or more old.

Ten Months.—At about ten months the body of the maxilla is seen to be wider and broader, due to the development of the permanent pinchers, which press upon the roots of the temporary pinchers, producing absorption, and these latter are found less solidly fixed in their alveolæ.

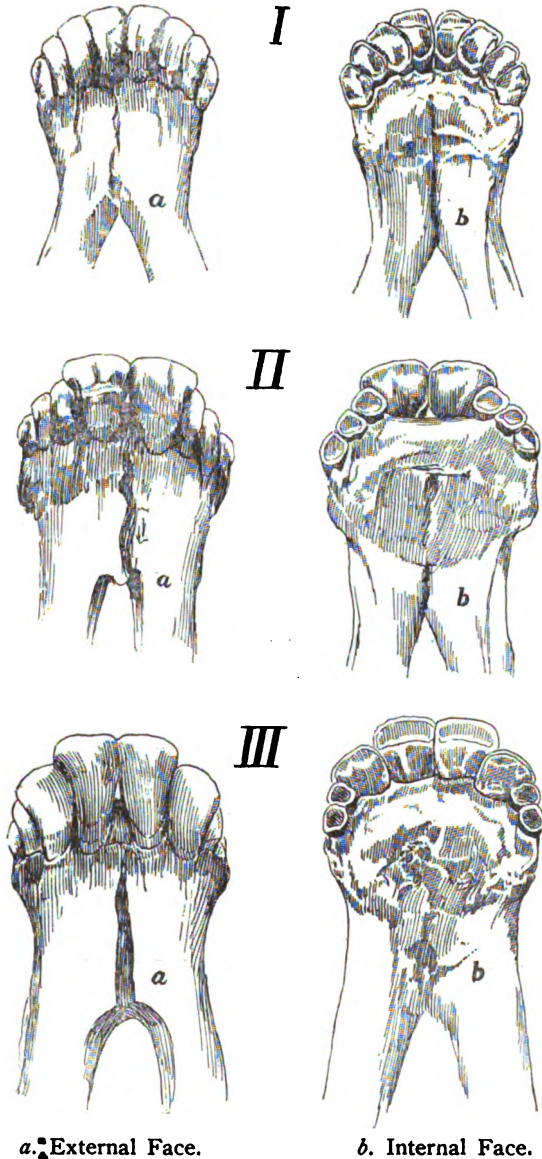
ERUPTION OF PERMANENT TEETH.

One Year to Fifteen Months (Fig. I).—At this period the permanent pinchers make their appearance. In the more precocious races the eruption of the pinchers takes place at one year, while in the common races it may not until fifteen months. Again, a question of individual development may hasten or retard the eruption by a month or two; so that the better-bred animal may be thirteen or fourteen months before the first two permanent teeth have appeared, while the more hasty, common animal may have its permanent teeth by the same time. In the male the eruption takes place very slightly earlier than in the female.

The conditions of the points on the fourth and fifth molars alluded to above will aid in deciding if the eruption has been hasty or tardy.

Eighteen Months (Fig. II).—At a year and a half the first intermediate permanent incisors and the six permanent molars

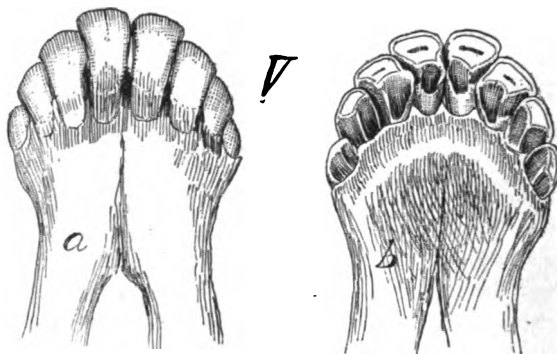
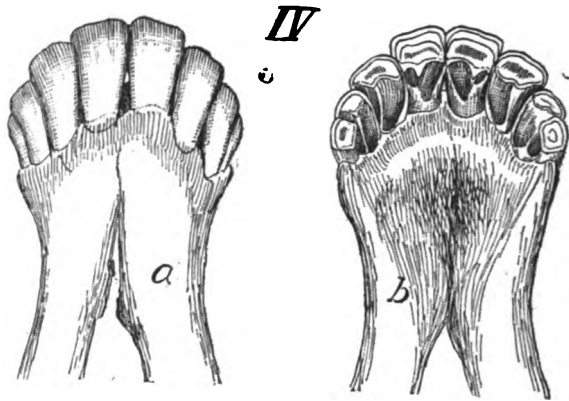
appear. The eruption of these teeth is followed very shortly by the falling out of all the temporary molars, which are replaced almost simultaneously by the permanent molars. After two years the molars furnish but little indication of the age. From this time, according to its sex, the animal takes the name of *ram*, or *ewe*.



a. External Face.

b. Internal Face.

Two Years and Three Months (Fig. III). About nine months after the eruption of the first intermediate teeth the second *intermediate* appears; whether in prococious or tardy races, the interval between the eruption of the first and second intermediate teeth is some three months longer than that between the former and the pincher teeth. In tardy animals, in which the first intermediate have not appeared until they are nearly two years of age, the second intermediate may be delayed until two years and nine months.



a. External Face.

b. Internal Face.

Three Years (Fig. IV).—At three years the eruption of the corner teeth takes place, although under the conditions given above certain animals may be several months late in completing their dentition.

A greater irregularity is found in regard to the appearance of the corner teeth than in the sequence of eruption of the others. By the time of the appearance of the corner teeth the pinchers and first intermediate may become worn and even leveled. Girard first noted that some sheep have but six incisors, the corner teeth remaining aborted under the gum.

After four years (Fig. V) there is a continuous but very irregular wearing of the teeth, which is governed by the nature of the food. Those animals which are fed on fine herbage and those which are stall-fed level off the tables evenly until but stumps remain ; but in all sheep there is always more rapid wearing of the pinchers and first intermediate teeth, which gives the plane of the tables of the arch a concave form.

Those animals fed on the hill-sides and where shrubs and undergrowth are abundant use their teeth much more rapidly, and wear notches between them like the markings on a horse, which cribs on a vertical object ; these notches are called very appropriately, by the French agriculturists, *swallow-tails* (*queue d'hirondelle*).

As age advances the teeth of the sheep are worn to stumps ; they become black and loose in their alveolar cavities.

In the old animals the face wrinkles, the lips become thick, and the muzzle, which was fine and pointed in the lamb, becomes enlarged and broad. Sometimes in old sheep, but more frequently in old goats, the incisors attain a great length ; the incisive arch is, however, in these cases usually broken and irregular.

DETERMINATION OF AGE BY THE HORNS.

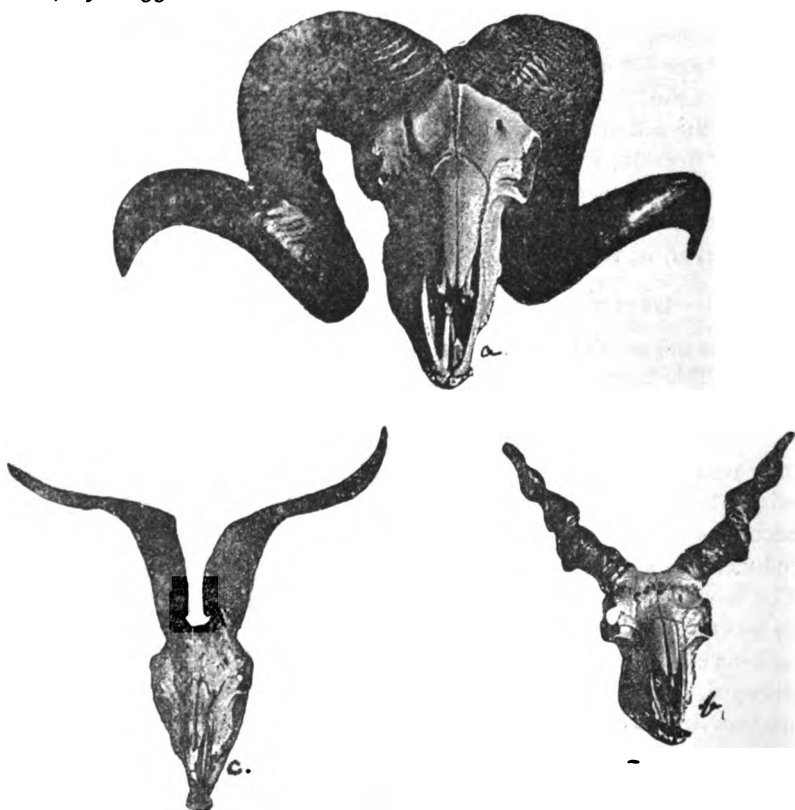
The horns of the ovine and caprine races are variable ornaments. Some races have horns, some do not ; in some races the male has horns and the female none, while in the others the female has very small, aborted apologies for them. In the long-wooled English sheep the horns are absent ; the merinos originally had the magnificent typical "ram's horn," which has become a descriptive of shape, but domestication has gradually reduced them in size, and in some families they abort entirely. The horn of the sheep grows up, out, back, and gradually turns on a central axis, according to its length, in the form of a conical cork-screw. The horn of the goat grows up, back, and slightly outward. In structure and growth the horns of the sheep and goat are like those of the ox. The horn of the sheep is flat on its inferior surface and convex from side to side on its superior

surface ; it is divided transversely by ridges ; the interspaces have longitudinal scaly ridges and gutters.

The horns appear about fifteen days after birth, attain their greater growth during the first year, and cease growing after four years. If the animal is castrated the growth of the horn lessens, whereas in the ox castration stimulates the growth.

The epidermic covering, which extends from the skin on the appearance of the horn, dries and scales off in six weeks to two months, leaving a roughened, scaly surface. The size and roughness of these series of scaly sections vary from year to year, and indicate the years until the horns cease to grow,—at four. Observations by Girard on the growth of the horns of merino rams (the horns of the merinos are the most typical) showed the growth to be:—

The first year, 19 to 20 inches ; the second year, 5 to 6 inches ; the third year, 3 to 4 inches ; the fourth year, 2 to 3 inches ;—in all, 29 to 33 inches.



a, Merino Ram ; *b*, Montenegrin Ram ; *c*, Goat.

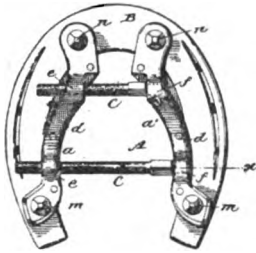
RECENT PATENTS

RELATING TO

VETERINARY MEDICINE AND ANIMAL INDUSTRY.

Issued by U. S. Patent Office since August, 1891.

457,260. REMOVABLE ATTACHMENT FOR HORSESHOES.
THADDEUS DE LYONS, Washington, D. C. Filed Apr. 23, 1890. Serial
 No. 349,733. (No model.)

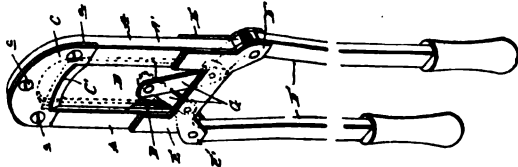


Claim.—A removable attachment for horseshoes consisting of two separate sections *a* *b*, formed to fit the inner edges of a horseshoe, adjustable heel and toe calks adapted to pass through said sections and engage the outer face of the shoe to prevent the attachment becoming loose upon the same, and adjusting-screws working in said

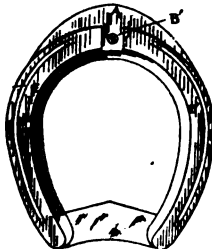
sections on opposite sides of their centres of length to clamp the attachment in place when expended and release it when contracted, substantially as set forth.

Claim.—The combination of the U-shaped body *A*, formed with the longitudinal recesses *P* and recessed at its outer end to form the seat *a*, the removable blade *C*, curved to conform to the curved outer end of the body *A* and having the curved cutting-edge, the frame-pieces *E*, secured to the inner ends of the body *A*, the blade *D*, sliding in the recesses *B*, the pivoted hand-levers, and the straight connecting-links *G*, pivotally connecting the inner end of the hand-levers with the lower end of the sliding blade *D*, substantially as set forth.

458,858. DEHORNING IMPLEMENT. HARRY W. LEAVITT, Hammond, Ill. Filed Apr. 11, 1891. Serial No. 333,544 (No model.)



458,181. HORSESHOE. ELLEN MATHER, Glasford, Ill. Filed Feb 13, 1891. Serial No. 331,739. (No model.)



Claim.—In combination with a horseshoe having the dovetail slot and the narrow flange at the forward end, the extension *A*, having the narrow flange *m* *m*, and the dovetail tongue *D*, with corresponding perforations in the dovetail tongue and the dovetail slot for the reception of the screw *B*, all substantially as described and set forth.

457,198. BLANKET-MUZZLE. NELSON GILLESPIE, Houghton Falls, N. Y., assignor of one-half to Chester Gillespie, same place. Filed Apr. 14, 1890. Serial No. 347,783. (No model.)



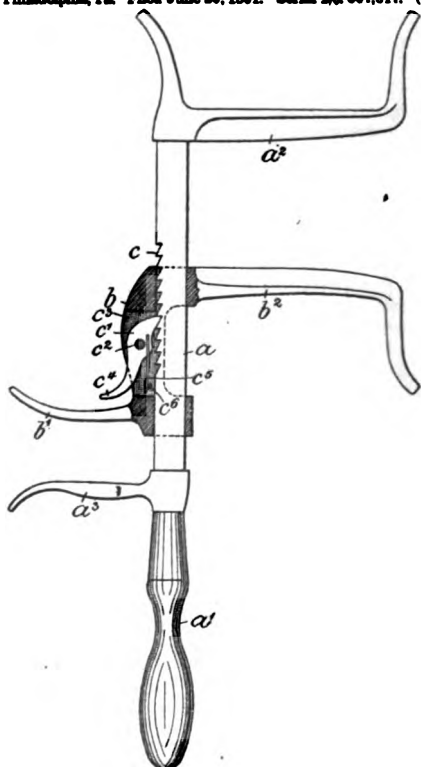
Claim.—1. As an improved article of manufacture, a blanket-muzzle consisting of a band or support provided with attaching mechanism for attaching the support to the head of a horse, and a link apron pendent from the rear portion of such support and adapted to extend below the mouth of the horse when in use, substantially as described.

2. In a blanket-muzzle, the combination, with a nose-band and detachable connections on such band for connecting the band with a

headstall, of an apron pendent from the rear portion of such band and adapted to extend below the mouth of the horse when in use, such apron being composed of a plurality of interconnected links, substantially as described.

457,911. VETERINARY MOUTH-OPENER. WILLIAM P. EDWARDS, Philadelphia, Pa. Filed June 29, 1891. Serial No. 397,817. (No model.)

Claim.—In a device for opening animals' mouths, a standard provided with a bit, a hand-lever and a rack, a traveler provided with a bit, a hand-lever and a recess, a catch pivoted in said recess and provided with a handle, and a spring for actuating said latch, substantially as and for the purposes set forth.



459,661. INTERFERING-BOOT FOR HORSES. PHILIP W SOMERLAD, St. Louis, Mo., assignor to Michael Debatin, same place. Filed Mar. 25, 1890. Serial No. 346,333. (No model.)



Claim.—The combination, in a horse-boot, of the strap 1, having the pad 2 and padded block, a flexible projection secured to said block, consisting of a single strip folded and having its outer end cut away so as to form the ears 9, and said folds being stitched or secured together as far as the points 7a and unsecured from such points to the ends of the ears, so as to

form an opening between the folds, a spindle passing through the openings thus formed in the ears, and a roller mounted on said pintle, substantially as set forth.

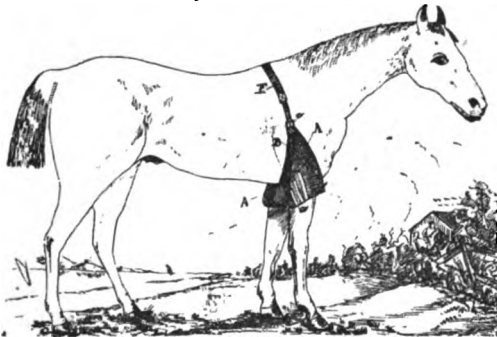
Claim.—The combination, with a boot, of a strap secured thereto, an angle-iron or device for securing the boot to the foot of the animal, and an elastic connection intermediate the strap and clip, substantially as described.

2. The combination, with the boot, of an adjustable strap secured thereto, an angle iron or clip for inserting between the shoe and hoof of the animal, and an elastic connection intermediate the strap or clip, such connection being detachable.

460,896. ANTI-INTERFERING DEVICE FOR HORSES. JAMES MICKLE, Fort Edward, N. Y., assignor of one-half to John F. Harris, same place. Filed Feb. 4, 1891. Serial No. 330,153. (No model.)



460,822. WEARING-PAD FOR HORSES. JONAS E. HAYWARD, Elmwood, Mass. Filed Apr. 15, 1889. Serial No. 307,336. (No model.)



Claim.—A pad of the character described comprising the two padded flaps provided with strips a a, the buckles C C, the straps G G, and a strap B, to which said flaps are secured, said strap adapted to encircle the horse, and a buckle c for said strap, substantially as described.

CASES.

FOREIGN BODY IN URETHRA.

By Herbert Neher, V. S.

My attention was called lately to a gray gelding 15½ hands, and very handsome. The symptoms presented were of a colicky nature; that is, he would roll, paw, look at his sides, etc., but the most noticable was his continual kicking, no increase of Temp. worth speaking about, he would stretch and try to urinate but could only produce a dribble. My diagnosis was obstruction "of some sort" in the bladder or urethra. I passed, or undertook to pass the catheter, but at a given point it would stop and I could not get it any farther. This point was just below the ischial arch. I then made an examination and found at this point a hard substance which I tried to work down, but could not get it to go either one way or the other. I recommended cutting down on it and removing it. I explained to the owner the consequences which *might* follow, and he consented. I injected a solution cocaine above and below the obstruction, cut down, and to my surprise, for I expected to see a urinary calculus, found it was the head of a catheter that had been passed by somebody and broken off, I think, in the bladder. Just when this was done, or by whom it was done, will always be a mystery, for the owner said he had owned the horse for almost a year. There was no particular deposit of the phosphates around it, but it was coated with a thick layer of mucus. My conclusion is that whoever passed the catheter used an old brittle one, and that in turning the ischial arch, it broke off and was pushed in the bladder.

Hence the necessity of using only instruments that are in first class order, and of the best make. I will add that the animal did very nicely, and made a complete recovery.

INTESTINAL CALCULUS.

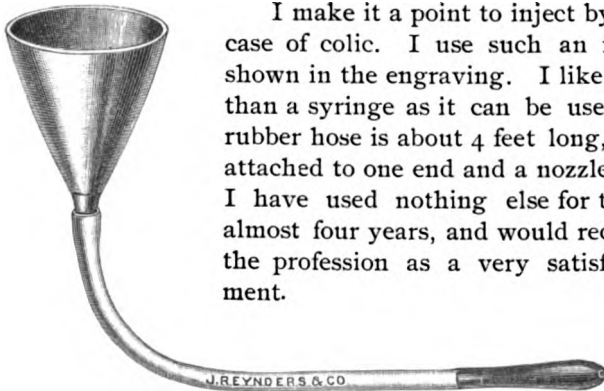
By Same.

I was called to treat a very large Blood Hound, that had been trying to defecate for one and a half days. He would suddenly start and run a short distance, squat, and try to have a passage; then he would set up a most unearthly howl; then he would be quiet for awhile, and go through the same performance again. His temperature was 104° F., his nose was dry and hot, mem-

branes red and injected. I came to the conclusion that it was a case of constipation, and gave him a large dose of castor oil and told the owner that I would call the next day, and that in the meantime if the dog had a passage I wanted to see it. I called the next day and found the dog very uneasy, keeping up his occasional howling. I noticed that he would bite at the anus very often, so I got his master to hold him while I examined him there. I oiled the parts, my hand also, I then formed my hand cone-shaped and dilated the anus, and as I began to go further in I felt something hard. I happened to have a pig forceps with me and used it as a dilator. I then could look in the rectum and saw what I felt. I took a pair of dressing forceps, introduced them in the rectum, took hold of the object and pulled it out, which proved to be an intestinal calculus about 4 inches long, and very sharp at one end. It was made up principally of vegetable matter. The dog was in the habit of visiting the horse stable and eating horse manure, as I have often seen him do. He recovered his usual spirits in a few days and seems to be all right now.

RECTAL INJECTION.

By Same.



I make it a point to inject by rectum every case of colic. I use such an instrument, as shown in the engraving. I like it much better than a syringe as it can be used quicker; the rubber hose is about 4 feet long, with a funnel attached to one end and a nozzle on the other. I have used nothing else for that purpose in almost four years, and would recommend it to the profession as a very satisfactory instrument.

LARYNGISMUS STRIDULUS.

By Thomas B. Rogers, D. V. S.

The Fleming operation for "roaring" does not seem to make much headway; almost all operators who have tried it report unfavorably on it. The operation of Møller is difficult; it is one

thing to talk about dissecting a mucous membrane from the arytenoid cartilage, quite another to do it successfully even on the cadaver. In most animals past their prime it is in part adherent and it cannot well be removed from Santorini's cartilage. It is true that the procedure suggested by Fleming, is antiquated in regard to the after care and antiseptics and this will necessarily be unfavorable with regard to the exuberance of granulations during healing.

Shall we then allow the condition of the larynx induced by left recurrent paralysis to be a *noli me tangere* of surgery? Is there no other way to restore these often valuable animals to their pristine usefulness? The writer believes that a remedy will be found in nerve grafting.

There is no operative difficulty in the way to prevent the distal end of the left recurrent laryngeal nerve being grafted on the right recurrent in the middle of the neck, and if muscle cells still remain intact in the atrophied crico-arytenoidei postici muscles there is no reason why the muscle should not in time become regenerated when supplied with healthy nerve stimulus.

Most surgeons of experience have seen the marked atrophy of the anterior crural region following peptone poisoning (azoturia) when the crural triceps muscle, the fascia lata and the anterior gracilis of the thigh disappear almost entirely through pressure on their nerves of supply, and gradually recover their tone and substance when the pressure on the nerves is removed and the current resumed. The same thing occurs in the aphonia of diphtheria in man.

I quote a case in point to show that there is no operative difficulty in the way: "A lacerated wound of the left arm had torn the median nerve. Deprès found it impossible to bring the central end of the torn nerve down so as to suture it to its corresponding fragment. *He therefore exposed the ulnar nerve and, having separated its fibres by tearing them apart with a pair of dressing forceps, and into the interspaces inserted the fibres of the peripheral end of the median nerve. The procedure was crowned with success and the patient recovered a useful hand.**

I believe that experiment on this line will bear fruit; and make the idea public in the hope that many surgeons will have many opportunities, while but few come to the individual. It cannot make a bad roarer much worse, and subjects the patient to no risk of life or remaining usefulness.

* Gazette Hebdom. de Méd. et de Chir., No. 5, 1876.

FOREIGN BODIES IN THE ŒSOPHAGUS OF BOVINES.

By Same.

On two occasions when attempting the removal of foreign bodies from the superior portion of the œsophagus of the cow the animal expired suddenly without any warning or difficulty of breathing. The obstruction could just be reached with the fingers and the left hand was in the œsophagus while the right pressed upward the foreign body. Now, when I fail to readily remove the foreign body through the mouth, it is my practice to cut down on the œsophagus, raise it from its bed and after introducing a little oil orally, to press the offending substance upward. The operation is easy, devoid of risk, and does away with the bruising of the parts, and the arm of the surgeon which usually follow prolonged efforts at oral extraction.

DIVISION OF THE CUNEAN BRANCH OF THE FLEXOR OF THE METATARSUS FOR SPAVIN.

By Same.

On two occasions this operation has been followed in my practice by enormous increase of the bony growth, and no amelioration of the lameness. In cases where, after firing and rest, there was remaining lameness, the operation has been entirely successful. I believe the place of this operation is as an adjuvant to the classical treatment, but as my experience is yet limited should be glad to hear the experience of others.

IOWA STATE VETERINARY MEDICAL ASSOCIATION.

The fourth annual session of the Iowa State Veterinary Medical Association will be held in the parlors of the Savery House, Des Moines, Iowa, November 12th and 13th, 1891.

S. STEWART, *Secretary.*

THE ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the Illinois State Veterinary Medical Association will take place at the Sherman House, Chicago, on the 17th and 18th of November at 10 A. M.

The following papers will be read: Dr. D. McIntosh, Parturient Apoplexy in Cows; Dr. S. H. Kingery, Pleuro-pneumonia in Horses; Dr. A. H. Baker, Azoturia; Dr. R. W. Story, Pulsa-

tilla, its Actions and Uses; Dr. Paul Paquin, The War of Cells; Dr. D. Wilson, Influenza; Dr. F. S. Schoenleber, Veterinary Agricultural Editorials; Dr. G. Z. Barnes, Tetanus; Dr. J. A. McDonnell, Glanders; Dr. O. J. Lanigan, Rare Cases; Dr. Khlotel, Tuberculosis; Dr. F. S. Billings, Recent Investigations; Dr. R. J. Withers, The Use of Antiseptics.

New members will be admitted and officers will be elected.

S. S. BAKER, *President*.

SELECTIONS FROM FOREIGN JOURNALS.

GERMAN AND FRENCH.

BY LEONARD PEARSON, B. S., V. M. D.

EXPERIMENTS WITH THE MAXIMILIAN METHOD OF TREATING COMPLETE TOE AND QUARTER CRACKS.

Army Veterinarian—Raid.

[*Zeitschrift für Veterinärkunde*, Vol. iii., No. 6.]

During the manœuvres of last summer a cavalry horse, with contracted heels, developed internal quarter cracks on each fore hoof. The following treatment was employed: The shoes were removed, the edge of the wall leveled and the wall thinned, from the coronet to the sole, for a distance of 4 c.m. on each side of the crack. The edges of the crack were smoothed and the sensitive tissues under it were freed from horn. The horse was then shod with bar shoes, the exposed laminæ coated with pine tar and a pressure bandage applied. The hoof was kept moist and the bandage renewed daily, for three days. After four days the bandage was no longer necessary, because the exposed soft parts had become covered with a thin layer of horn. In five days the horse could be exercised and in eight days was ready for service. During the manœuvres the horse was used daily and the quarter cracks healed completely.

Another horse, with regularly shaped but somewhat spreading hoofs, acquired quarter cracks on both front feet, some six days before the manœuvres. In spite of the fact that the crack bled, at first, and caused great pain the horse recovered under this treatment, although it was given hard work every day.

Since July, 1890, I have treated 27 cracks of the hoof, by this method and have been able to cure every case. After having once healed none of them have re-appeared.

The kind of hoofs, upon which the cracks developed, were the following :

1. Regularly shaped hoofs, 8 times.
2. Flat hoofs, 9 times.
3. Hoofs contracted at the heels, 6 times.
4. Short (stumpy) hoof, 1 time.
5. Medium, or half broad half narrow, 3 times.

After the operation, the soft parts soon became covered with horn and the cracks filled out gradually.

An excess of horn always forms on the coronet, which must be removed, with a rasp, every third day. If the crack was very near the heel, the wall would be cut down so that it would not press on the shoe ; while if the crack was on the toe, or side, a crescent-shaped piece would be cut out of the wall, in order to remove press-ure.

It is interesting to note that some of these cracks were of six or more years duration and had been treated with all sorts of devices and methods without success, but that they were healed at once by this operation.

In some of these cases the horn had become bent in at borders of the cracks. All of the 27 hoofs are now of a better shape than they were, the heels are broader and the gait of the horses is freer.

I allow the bar shoes to remain from five to six months. From my experience I have no hesitation in recommending the operation in the highest terms.

[This method for the treatment of toe cracks and quarter cracks has been taught and employed at the Veterinary Department of the University of Pennsylvania, for the past six years, and has given the best of results. Translator.]

ERYSIPELAS IN A COW.

By Lucet.

[*Recueil de médecine Vétérinaire*, Vol. viii, No. 7.]

This disease, which is exceedingly rare in cattle, commenced in the neighborhood of a tumor, about the size of a hen's egg, on the cows head.

The inflammation and œdema spread rapidly over the head, neck, breast and limb. The temperature reached 41.2° C. Internal and external treatment was of no avail and the animal died, after a sickness of fourteen days.

Microscopical examinations were made of the contents of the

swellings and it was found to contain, among other micro-organisms, streptococci, which resembled the organisms of erysipelas of man. (*Berliner Thierarz. Woch.*, vii., 34.)

ACTION OF GLYCERIN IN THE RECTUM.

By Fortuna.

[*Progrès vét.* 1890, 9.]

A number of authors have recommended clysters of glycerin, in doses of 5 grms. for the horse and $\frac{1}{2}$ grms. for the dog, as an excellent evacuant. As some did not obtain as good results as others, Fortuna conducted a series of experiments on 40 horses, 3 cows, 4 calves, and 14 dogs with the object of determining its real value. In some of the animals the experiments were repeated ten times. The results were as follows: In healthy animals an action of the bowels could be produced in from $\frac{1}{2}$ to 35 minutes (rarely as long as one hour), by which hard (never soft) excrement would be voided. Fortuna was able to show that even this action did not take place unless the rectum was full. In cases of constipation of the horse this remedy was not sufficient to produce an action, but in the dog, sometimes, caused the evacuation of the contents of the rectum. The experiments lead the experimenter to conclude that glycerin, even in doses as large as 15 gm., has no purgative action in the horse. Its action is a simple local irritation of the mucous membrane of the rectum. (*Berl. Thie. Woch.*, vii., 38.)

DISTURBED LOCOMOTION (ATAXIA) IN A HORSE.

By Magnin.

[*Recueil de Méd. Vét.*, Vol. vii., No 11.]

A Hungarian saddle horse, which was very susceptible to attacks of colic, was brought to the writer for treatment for this disease.

The rider experienced difficulty in keeping his seat, as the animal kicked continuously. In the stable, the horse stood with the back arched and the hind legs drawn under the body. When an effort was made to have it "stand over," the horse moved with great difficulty, took short steps and flexed the joints as little as possible. The colicky symptoms disappeared in the course of a few days and the general condition of the animal

improved. When the horse walked the legs were strongly flexed at the hocks, drawn forward with a jerk, held in the air for an instant and then dropped heavily to the ground. A trembling of the hind quarter accompanied this movement. In the weeks which followed, these symptoms extended to the fore limbs, so that in walking all of the joints would be strongly flexed. At this stage the hind legs would not be brought forward in a straight line, but followed a zig zag course. When the horse's head was covered it could be made to move only by great urging and its progress was very unstable.

Continued exercise helped the animal a little, but as it was subject to frequent relapses the owner sold it.

Magnin thinks that this was a case of locomotor ataxia, due to a lesion of the spinal cord, but the symptoms were not so characteristically developed as in man. (*Berl. Thierarz. Woch*, vii, 32.

IODOFORMED ETHER TO PREVENT LOSS OF SKIN AFTER FIRING.

By Prof. Nocard.

[*Recueil de Méd. Vét.*, August, 1891.]

To prevent the loss of skin, which is one of the gravest accidents that may follow firing, Professor Nocard recommends a spray of iodoformed ether. It causes the pain to disappear almost immediately in most cases, and when the eschar separates, the wound is found to be already covered by epidermis and in a fair way to cicatrization. Its good effects appear due to its power of suppressing pruritis and opposing bacterial infection.

ENGLISH.

A CASE OF SUPERFŒTATION IN A MARE.

Prof. Malet.

[*The Journal of Comparative Pathology and Therapeutics.*]

In the *Revue Vétérinaire* for August, 1891, Professor Malet records a very interesting case, which proves incontestably the possibility of superfœtation in the mare. As a rule impregnation puts a stop to œstrum, and that does not re-appear until after parturition. According to M. Saint-Cyr, the female domestic

animals refuse the male six to eight days after a fruitful copulation, but, as Professor Malet remarks, exceptions to this rule are not rare, and well known to breeders. Mares that have already conceived frequently take the stallion readily, even although the pregnancy has already lasted for several months, and the same is seen in the cow, but more rarely. The question whether impregnation may follow such a second copulation has been disputed. It is necessary to draw a distinction between this phenomenon, which is properly termed *superfœtation*, and two others with which it is sometimes confounded, viz., *simultaneous fecundation*, and *superfecundation*. Simultaneous fecundation is applied to cases in which several ova simultaneously extruded are fertilised by the same male, while superfecundation denotes the fertilisation of ova of the same period by different males.

The following case is undoubtedly an example of superfœtation :

A mare, aged 14 years, was covered with a donkey on the 18th, 19th, and 25th of March, and the 8th of April, 1890; and then with a stallion on the 8th of May. These dates were registered in the establishment to which the mare belonged, and they have been verified by Professor Malet. Eleven months after the first service by the donkey, and ten months after the single service by the stallion, the mare gave birth to two young, viz., a mule and a foal. Parturition was laborious, owing to a mal-presentation of the mule. This mule, which was small for the breed, was never able to stand alone, but it lived for three days. The foal, born dead, was expelled without difficulty. Its development was incomplete, the only hairs present being on the tail and mane.

COMMUNICATIONS.

Editor Journal of Comparative Medicine and Veterinary Archives.

Dear Sir :

Will you kindly make the following corrections in the report of the proceedings of the United States Veterinary Medical Association, so far as the part which I took in the discussions is concerned, as published in the October number of your Journal.

On page 507 it should read : "*I do not know about Dr. Law, not having seen him lately,*" instead of "*I do not know anything about Dr. Law, never having seen him,*" as printed. In the

seventh line of the same paragraph substitute *would* for *should* and in the eighth line insert the word *have* before *felt*; also in the second line of the last sentence in the same paragraph substitute *may* for *would* before *have*, and *would* for *should* before *like*. In the third line of the last sentence substitute *would* for *should* before *not*. On page 548 in the sixth line from the foot of the page substitute *I have had the* for *it has been my* before *opportunity*. On page 549 in the last sentence but one of the second paragraph place a *period* after *cultivation*. Substitute *cultures from these colonies* for *and* before *inoculation*, and *inoculated* for *inoculation* before *into*. Substitute *though* for *if* after *even*. Insert *original* between *the* and *sick*. Insert *killed the animal* between *animal* and *and*. Insert *were* before *absent* and omit the *last three words* of the sentence. In the last sentence of this paragraph omit the word *other* before *matters* and add to the sentence the words *while Dr. Salmon is right in certain other matters*.

Yours truly,

A. W. CLEMENT.

Baltimore, Md., October 9th, 1891.

Boston, Mass., Oct. 14th, 1891.

Editors Journal of Comparative Medicine and Veterinary Archives.

Dear Mr. Editor :

I have just received the JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES for October 1891, containing my article on "Cattle Transportation," read before the United States Veterinary Association at Washington. In our hurry at the meeting and the imperfect condition of my manuscript, I find several errors and omissions, which I beg of you to correct. On page 500 read for "scale sheep"—"sheep scab," and on page 501 the words "poor creatures" ought to come after "stiffs" instead of after the word "situation"—"poor creatures" applied to the "stiffs" not to the agents.

In the discussion that followed, owing to my own deafness and the poor acoustic properties of the hall, which the stenographer complained of also, *I find my remarks entirely unintelligible*, and the remarks of the other speakers quite different from what I understood them to make; indeed their remarks as printed are so irrelevant that I will defer any criticism of what they are credited with saying until they have time to correct or endorse them.

The remarks attributed to me on page 583 should read :—
“ The changes enforced at present under the new Regulations for cattle shipments abroad will bring no better results so far as freedom from hardships is concerned than was obtained under the old system when no such regulations had to be enforced in the shipment of animals. The fact is you have attacked the wrong end.

Inland transportation and the class of animals has most to do with the condition in which the cattle are received aboard ship and determine more than any thing else the success of the ocean voyage. You are embarrassing the ships ; I say that is wrong and that somebody is to blame for doing an inconsistent thing, an imperfect piece of work. ”

Again on page 584 I said :—

“ Instead of changing the spaces on the ship it would be better to regulate the size and weight of the animals. Do you mean to tell me that great heavy “ distillers ” are as good to ship as “ stockers,” the chances for their going wrong in the stock yard, or any where else being entirely removed ? I say further that instead of changing the ships now, you ought to wait and see what grade or class of animals will be allowed to be shipped (should the restrictions abroad be removed). That is the point to be attained. Make this a respectable business, and ship no cattle but those grades and sizes known to be best able to stand the voyage.”

In my remarks page 585 with reference to barren mares, I wished to be understood as saying that animals with defects in such important parts were not safe to breed from, many of these changes being the results of domestication and restraint ; they might possibly be perpetuated by animals so affected.

Yours very respectfully.

WILLIAMSON BRYDEN.

Editors Journal of Comparative Medicine and Veterinary Archives,
Gentlemen :

In your Journal, Vol. XI., 1890, p. 542, is the following from the Chief of the Bureau of Animal Industry :

“ I am prepared to say that Texas Fever is not a bacterial disease. There are no peculiar bacteria to be found in the blood ; spleen, liver, or other organs. All the illustrations which may have been published showing preparations of blood from Texas Fever animals swarming with bacteria, and sections of tissues

showing the same micro organisms are misleading and of no value to the student of the disease."

It would be either a bold man, sure of his ground, or one, who was reckless of consequences, who would make so positive an assertion as the above in the face of existing facts.

In contradiction thereto, I now say (and am willing to suffer the consequences,) that a germ is the cause of Texas Fever, and that it is the same germ previously described by me, and found in four different outbreaks of Texas Fever in Nebraska cattle, the original specimens from which can be seen at any time in this laboratory.

I also pronounce the assertion of the Bureau of Animal Industry that Texas Fever is due to a zoospore or some form of malarial parasite to be wrong.

Recently I received from Dr. Tait Butler, V. S., Agricultural College, Miss., a box of ticks. Selecting one of the best and plumpest, I washed it in corrosive sublimate, then in alcohol, then in distilled water and cut open its neck with a sterilized knife. From the cut oozed out a thick, black semi-fluid material. In the same smear proportions gave a germ looking like the one previously described by me; cultures from this material were pure, as proven by tests, and all other tests gave the same germ. Inoculation in cattle produced unequivocal Texas Fever, and from the dead cattle absolutely pure cultures were obtained, and blood specimens give the same germ. Nothing can be plainer, but I have taken the precaution to have trustworthy officials of the University see every step I have made. Cultures have been sent to Prof. Welch, of Johns Hopkins, and to Koch's Laboratory at Berlin, requesting that the experiments be repeated.

Respectfully yours,

F.S. BILLINGS, *Director,*
Patho-Biological Laboratory of the
State University, Lincoln, Neb.

SOCIETY PROCEEDINGS.

Pennsylvania State Veterinary Medical Association.—The Pennsylvania State Veterinary Medical Association held its Semi-annual Meeting at Wilkesbarre, September 8, 1891, in the County Medical Hall. Drs. Kooker, G. B. Rayner, Hart, Shaufler, T. B. Rayner, Hoskins, Goentner, Ridge, Foelker, Stanton, Timberman, Butterfield, Keil and Sallade were present. Visitors were Drs. C. H. Good, Kellar, Vanderbilt, Bloom and Walters.

Minutes of March meeting read and approved. Dr. Hoskins recommended having blank forms for applicants for membership, to facilitate finding the standing of applicant.

Applications for membership were made by Drs. Waugh, of Allegany City; Kellar, of Williamsport; Good, of Lockhaven, and Millar, of Prestentown; the Censors reported favorably and they were elected.

Report of Committee on Legislation, Dr. Hoskins Chairman: "As your Chairman on Legislation I can only report the greatest inaction on the part of your committee for the past six months that has occurred since its original appointment. The causes for the lack of seeming duty is well-known to you all by this time, and we as your committee offer no excuse for its existence, inasmuch as the unfortunate amendment to our act, extending the time of registration of non-graduates had become a law before your committee knew of its existence, and was conceived and blossomed into the mature flower before one-half of those who constituted our legislators dreamed of its possible conception, I would not underestimate the responsibility resting upon those who knew of its probable birth and witnessed its entrance into life, and who did at the same time realize the necessity of informing your committee of its existence. The additional registrations so far as learned have not been excessive owing to the unusual number who had done so before the first limit of the time had expired. In Philadelphia but four new graduates have registered since its passage. At present we are pressing fearlessly, through the able assistance of Dr. Jas. A. Waugh, of Pittsburg, two prosecutions on the ground of false statements as to the possession of diplomas registered in Alleghany County. One of these, unfortunately, is a member of this association, much to our regret; but no leniency will be shown on this ground as he, above all others, should have known better and well deserves to be meted out a just punishment. What further action remains to be taken between now and January 1st., will entirely depend upon circumstances arising from time to time. We believe it is wise to remain quiet until that time lest an unfavorable decision against us would encourage a large number to register, which would necessitate a very great expenditure of time and money to eliminate."

Dr. Waugh will be furnished money for prosecution by the Association.

Dr. Hoskins presented a bill of \$26.96 as costs in the Lancaster suit, which was ordered paid.

Report of Committee on Intelligence and Education, Dr. Huidekoper, Chairman, not being present the report was made by Dr. Sallade.

MR. PRESIDENT AND GENTLEMEN :

While nothing of special moment has taken place in veterinary practice since our last annual gathering nevertheless we cannot help congratulating the society and the profession in general upon the steady advance which Veterinary Science is making throughout our own country and abroad, and while much work might be desired in certain quarters in the way of organization and consolidation, still we have every reason to congratulate ourselves that there never was a time when so many able practitioners were at work, or so many learned publications bearing upon the profession issued from the press in various languages as to-day. The great impetus given to every department of science by the investigating, analytical spirit of the age has fairly taken possession of our particular field, and it is our glory in this land, and in this age to be the witnesses as well as adepts in a most useful science which was regarded as venerable among the most remote peoples, of whom we possess authentic history. The high antiquity of our profession, the supreme importance which it occupies in the physical economy of our modern society, its eminent respectability with all, at once constitute us the guardians of the physical welfare of those dumb animals which a Beneficent Providence has been pleased to surround man in order to aid his comfort and enjoyment; and thus in lending our intelligent efforts to the conservation of them we are indirectly laboring in the highest behests of society itself.

It is for these reasons that it well becomes this society to enlist in its behalf the best intelligence to be obtained and insist upon a thorough scientific course in some recognized veterinary school preparatory to entering upon legitimate practice, and in this particular your committee feels itself constrained to reiterate with emphasis the various salutary recommendations of former committees on intelligence and education of this society, and those especially which regard the duration and quality of the course of study to be pursued, as well as the character of the student himself. For it cannot for a moment be doubted that the learning and character of our practitioners will have, I may say, all to do with the shaping of the destiny and the attainments of the ultimate results of veterinary science; and it has for this reason, as well as on account of the close relationship existing between the methods of treating the various diseases of man and beast, that the veterinarian should, in justice to his profession, emulate the character and rival the scientific attainments of his brethren of the sister medical profession. Upon the character, as well, of our practitioners will in no small measure depend our success when we knock at the door of the halls of Legislation and demand that protection and pecuniary encouragement which a science so far-reaching in its consequences to society merits, and which are, as its worthy representatives, will have reason to expect will be granted us. The age of the so-called Horse Doctor is gone forever.

We are instead an organized body of veterinary physicians, extending the benefits of our science to, and the prolonging our efforts in, a broader and less restricted field than heretofore. The horse is only one of the objects of our professional solicitude. The various species of cattle and other

domestic animals, especially those whose flesh is used for human consumption, likewise belong to the sphere of our scientific investigation. The splendid scientific triumphs of recent years in bacteriological and tubercular pathogeny are matters of the most profound interest to the veterinarian and should engage his most earnest attention, and in connection with this, your committee would suggest that within the jurisdiction of this society where so many Jersey cattle are imported and raised, the special study of tuberculosis is absolutely necessary in order that we may be able to intelligently answer the many calls made upon us, since it is quite as certain that the great majority of this breed of cattle is infected with the dread disease in either a mild or malignant form, as it has recently been proved to a certainty that the milk and butter obtained from them carry with them the germ of tuberculosis. And while recommending this special study on account of the peculiar circumstances in which we find ourselves placed, in a general sense your committee would also recommend, in case the society still believes in the old adage that an ounce of preventive is worth a pound of cure the thorough study of prophylactics, always interesting, even when not applied; and thus having as it were, both ends of the disease, whatever it may be, within our grasp, we will be able the more readily to respond to the expectations of our patrons, and the sooner merit the title which it should be the ambition of each and every one of us to covet. *The Title of Fine Veterinarian.*

It was moved that the report be recorded and a vote of thanks extended to committee carried.

Dr. Zuill, Chairman of Committee on Sanitary Science, was not present. Dr. Timberman said they had no report to offer.

A Veterinary Association having been started in Pittsburg by Drs. Waugh, Carter and McNeil, it was moved that the Secretary send Dr. Waugh our best wishes, and ask him to send delegates to our next meeting.

Dr. G. Myer, having been charged with false registration, the charge was referred to Board of Censors at the March meeting. Dr. Sallade moved to expunge from the minutes that part refusing honorary membership to the gentleman he proposed, Carried. Dr. Hart moved that the Code of Ethics be read at every meeting, which was lost.

A communication was received, stating that Dr. Weber has been very sick with typhoid fever, but was improving slowly. Dr. Kooker spoke of Dr. Weber's misfortune in sickness during the last few years, and Dr. Hoskins moved that we tender him our sincere sympathies, which was carried.

Dr. Hart said that the President should give us a lecture to improve us in our actions toward one another, to stop this wrangling about the Code of Ethics.

The Treasurer was directed to notify the Secretary of the names of the delinquents, so that they can be acted on at the March meeting.

A paper "Results of Laryngitis," was read by Dr. Butterfield. Dr. Hoskins read a paper on "The Veterinarian as a Sanitarian." The Association extended a vote of thanks to Dr. Hoskins, and also ordered 1,000 copies printed for distribution.

In discussion Dr. Hoskins said, if we had sanitary inspectors we have no adequate sanitary laws; if we discover a case of glanders in the north-west part of Pennsylvania, we have to send to Dr. Bridge in Philadelphia before action can be taken. We have no member on the Board of Health, nor are we even recognized by it. The public should be educated up to the point that they will demand laws governing public funerals in case of contagious diseases. He stated that eighty children died in one town of diphtheria, yet nothing was done to prevent the spread of the same.

Dr. Sallade said he had read a paper before the Association on "Cremation," and that he is also a leader in the "Bovine Association." This association had brought dollars into his pocket and aroused the people to the dangers in the food supply. He had rid the community in which he resides of tuberculosis in cattle; when a man buys a cow, the Bovine Association sends him to examine the cow, and if tuberculous it is at once dispatched. He diagnosed tuberculosis by slight rise in temperature, tenderness along the spine, emaciation, continued œstrum, and sibilant rales in lungs.

Dr. Ridge read a paper on Abscess of the Guttural Pouches. *Vide.*, fol. 620.

Drs. Rayner and Hoskins thought it was originally an injury. While Dr. Shaufler thought as Dr. Ridge that it was pharyngitis at first then extending to pouch. As Dr. Shaufler had a case very similar, which he felt very sure was originally pharyngitis. Dr. Ridge cited a case of gangrene of anterior lobe of lung without being recognized by two good practitioners. Dr. Hoskins thought we might have gangrene of a small portion without being readily recognized, but thought we always have our increase in temperature, and as it is very difficult to auscult that portion of the lung, we have to be on our guard. Dr. Sallade thought the injury was an old one. A vote of thanks was extended for report of the case.

Dr. Hart said that fifteen years ago no veterinarian would dare acknowledge a mistake. But to-day they will call a brother practitioner in at any time, and talk over a case as true men should do. We are here to exchange ideas, it is seldom we find every one of the same opinion. Dr. Hoskins reported his visit to the New Jersey Association, and expressed himself as being well pleased with his visit, he spoke of receiving a letter from a veterinarian censoring him for encouraging quacks (non-graduates) to join our association. On the paper that the letter was written was illuminated a barn-yard scene, and explaining the place of graduation, etc. It is needless to say the writer received a very caustic reply, he said, "We made no mistake when we take in gentlemen if they are non-graduates, as some of our best workers are non-graduates."

President Kooker advised the local veterinarians to form associations. We should have these all over the State. Dr. Kellar reported a case of a mare, that had a discharge from the vulva, she had aborted a short time before, on examining vagina could not find anything to cause the trouble, but on dilating he found a hard substance inside when he removed four calculi. When he found the fifth so sharp he had to wrap a chamois around it before removing it. In the following July he saw a similar case, the hymen was not ruptured, found os entirely closed, dilated with forceps and removed four calculi. A short time after saw another case, of a Western mare which had

a discharge per vulva, and was ruptured, when on examination he found a calculus in uterus. Stones resembled those lying in road, at first he thought they had been placed in the uterus to prevent eversion, a mare aborted a short time before, but when he came to the case of imperforated hymen, then he could not imagine how it gained entrance. The stones were sent to Dr. Kooker to be examined.

Dr. Good reported epidemic ophthalmia in horses, around Lock Haven.

Three bills amounting to \$28.75 in favor of Dr. Gladfelter were ordered to be paid. Delegates appointed to attend the United States Veterinary Association, are Drs. Faelker, Harger, and Webster.

After which the Association adjourned, when Dr. Walters escorted the members and wives to the Nottingham Coal Mines, after going down and seeing the mining of coal they returned to their homes, feeling highly pleased at the meeting and kindness shown them by the Wilkesbarre Veterinarians.

W. H. RIDGE, *Secretary Pro Tem.*

Keystone Veterinary Medical Association.—The regular meeting of the Keystone Veterinary Medical Association was held at the College of Physicians, Philadelphia, October 3rd. The meeting was called to order by the president, W. Horace Hoskins. There were present: Hoskins, J. B. Rayner, Kooker, Lintz, Cullen, Webster, Eves, Werntz, and Schreiber; also as visitors, Drs. Senseman, Gadsden, McDowell, and Benjamin Lee, Secretary of the Board of Health. The secretary read a communication from Dr. A. Liautard acknowledging receipt of invitation and regretting his inability to be present on account of the opening of the American Veterinary College.

The president read the following communication received by morning mail:

DEAR DOCTOR: I will certainly appear to-day at the College of Physicians before the Keystone to read my paper. But I will not say very much, on account of the controversy and very entirely opposite views and experiences on this subject. But it might lead to interesting discussion. Yours,

H. P. FORMAD.

And the following, received by evening mail:

DEAR DOCTOR HOSKINS: My brother is in distress to-day. He left for New York at 3 P. M., this afternoon to attend to a criminal case of great interest and which had to be attended to at once. He even did not have time to notify you personally, as his departure was sudden, and asked me to wait upon you. Brother suggests some one else open the discussion on the question at issue to-night, which no doubt will lead to an interesting discussion. He is very sorry not to be able to participate in it.

Very respectfully, ROBERT FORMAD.

The secretary read the following communication:

1008 N. 6th Street, PHILADELPHIA.

DR. W. S. KOOKER,

Secretary of the Keystone Veterinary Medical Association.

I hereby present my resignation as a member of the Keystone Veterinary Medical Association.

Respectfully,

ROBERT FORMAD, V. M. D.

PHILADELPHIA, October 1, 1891.

Dr. Lintz proposed the name of John MacFayden for associate member. The last two communications were referred to the Board of Trustees for action. The president said that he was extremely sorry for the absence of Dr. Formad, as the subject of the transmission of tuberculosis by milk, was one of great interest to the sanitarian, whether human or veterinary practitioner. Dr. Gadsden was called upon. He said that in his own practice he had seen many cases, which point to the danger of using infected milk. He gave the case of a cow affected with the disease, which he ordered destroyed; but it was not. The owner's wife used the milk of the cow, drinking it warm; and, later, contracted tuberculosis, from which she died.

Dr. Wertz reported a case of a healthy calf, which was experimentally fed at the udder of a tuberculous cow, and contracted the disease; and other cases in which healthy pigs were fed on tuberculous milk and contracted the disease. There was a family living in West Philadelphia, consisting of a father, mother, and eight children; the father an exceptionally strong, healthy man from a family of long lives and free from any tubercular taint; the mother had no knowledge of any of her family having died from any tuberculous trouble—all were healthy people. Six of her children were raised by the breast and all the very type of physical strength. The other two were raised by the bottle (on account of the mother having in each case a gathered breast). These two died with consumption. The inference to be drawn in these cases is, that the germs were taken into the system by the milk from tubercular cows.

Dr. Webster stated that there was a great amount of tuberculosis in his practice. In one dairy they fed some of the milk to a pen of pigs, which produced the disease in them. One of the pigs was killed and the tubercular lungs sent to him for examination, and a part of the lungs was eaten by a cat, weighing not less than twenty pounds. The cat is now in the very last stages of consumption.

Dr. Eves states that about Wilmington, there is a great deal of the disease among the cattle, the milk of which is consumed by the citizens of Wilmington. Drs. McDowell and Cullen said that their experience agreed with that of the previous speakers. Dr. Benjamin Lee, Secretary of the Board of Health of Philadelphia, said that he was glad to be present and to see the interest taken in the subject. Go on agitating and investigating the subject and his board would give all the aid that lays in its power. There is no doubt in his mind that many of the diseases that are not traceable are due to the transmissibility of the germs from diseased meats or milk. What we want is greater interest to be taken in the subject by the veterinarian and physician. If the medical practitioners of both branches would do their duty we could get legislation to greatly decrease disease and epidemics. You are all aware of the efforts made by the Board of Health to prevent the pollution of the streams of the State, and our defeat by our learned Legislature, due, in part, to the apathy of the medical profession and largely to the money of the manufacturers, dyers and butchers. Dr. Schreiber, Milk Inspector for Philadelphia, was of the opinion that tuberculosis is transmissible not only from animal to animal but also to the human subject. The best and surest way to remedy the evil is to destroy the animals affected.

Dr. Eves reported the following cases : He was called on June 16, 1889, to visit a cow suffering—as the owner stated—with a mysterious disease ; having had seven to die within two or three weeks, this one making the eighth. The herd consisted of nine cows and one calf. He found No. 8 very weak—staggered when made to walk. Her posterior limbs were apparently partially paralyzed ; slight flow of saliva ; eyes of an anxious, haggard appearance ; slight protrusion ; diarrhœa ; painful tenesmus ; symptoms given of frequent licking and biting at the feet and lower part of legs (posterior) ; appetite impaired. No trouble given as to drinking. Inclined to be dull but at times uneasy. Pulse weak and accelerated. Temperature normal. History of having been sick for several days and growing weaker. The other seven were held in about the same way, excepting one Jersey cow which was inclined to be cross but not violent. The owner placed a great deal of stress upon the fact that they were continually biting and licking their feet and legs. He would not allow me to destroy her, but was to inform me of her death. Searched the pasture ; found nothing unusual. Cows had been running on pasture as usual all spring. On July 3d, held post mortem and found No. 9 sick also ; destroyed her, and found both presenting about the same lesions. Rumen contained a quantity of grass. Omasum was in a state of dry impaction (very dry). Posterior to this, intestines and fourth stomach were empty. Intestines manifested lesions of diarrhœa (no enteritis). The liver tended to be rather friable. In fact, no marked lesions excepting the impaction of third stomach which was complete in both cases.

The owner asked me this time to give him the symptoms of hydrophobia in the dog, which I did. He then told me that his dog certainly had the disease and that he had seen him chasing and biting the cows several weeks previously. He acted so strangely that he shot him ; but at time thought nothing of his chasing the cows excepting that it was unusual for him to do so. I did not make a diagnosis ; in fact, I was at loss to know what disease I was dealing with. On July 4th, the next day, I was called in another direction—about eleven miles from the first place—to see some cows. I found two cows with precisely the same symptoms as the others I had visited, with the history of several having died within two weeks. These cows were not violent—I could handle them as the others ; but they seemed to be a little wild. I learned the history of two dogs having been seen biting the cows about five weeks previous to my visit. The cows were bitten, and bitten considerably ; but the bites were all healed at the time of my visit. Did not get a chance to hold post mortem.

On July 17th was called by another party to see a cow in the same district. Cow showing same symptoms, no history of any dogs ; but his neighbor, about half a mile distant, had lost nearly all his cows, and he had shot a dog in the act of biting them. I drove over and received a complete history from the man that shot the dog. The symptoms were precisely the same as those given previously, and every cow that was bitten died. His brother directly opposite had also lost a number of cows ; the same dogs were seen among his cows and had bitten them.

These cows had all been treated by a veterinary surgeon, but not one had yielded to treatment. The dog was a collie and belonged to a farmer

about three miles distant. His partner (the other dog) escaped, but was shot some time afterwards by his owner on account of acting in a peculiar manner. About a week after this another man from nearly the same neighborhood, only one mile from cases No. 2, called me to see a cow. I found her down with the same symptoms, but much wilder. Her eyes were rolling, her head swinging, and she was bellowing and frothing at the mouth. He had had five others die and one of them became very violent and was shot while in the act of breaking everything to pieces. The same dogs were seen among his cows. I came to the conclusion after seeing cases No. 2, that I was dealing with Rabies and after getting the history later, I am confirmed of the diagnosis of Rabies, as these farmers are all reliable men and I believe their cows were bitten by these dogs, as they state, and the same dogs, with the exception of cases No. 1, visited each herd that was affected. I at first thought of Texas fever, but the post mortem changed my opinion immediately. About fifty cows in all were affected and died.

Dr. Hoskins reported the following case : The subject of this somewhat unusual and unique case, was a large Maltese cat about two years old. Was injured on March 9th from a flobert rifle ; with bullet marks at both inner and external canthi of right eye. The cat ordered to my infirmary on the 10th. Treated antiseptically, in conjunction with anodynes locally, until the 26th, when I considered extirpation of the entire eye the best treatment, which was done. On the 5th of April the animal was sent home, with the entire healing process apparently completed. On June 8th my attention was again called to the cat, and I found the orbital cavity partially filled with a catarrhal discharge. A mild astringent wash gave the necessary relief in a few days. On August 25th, I was summoned to attend him for lameness. A thorough examination of the right fore-limb, failed to reveal any cause for the same and I again ordered him to my infirmary for treatment. On a second examination, after watching the animal for twenty-four hours, I diagnosed a paralysis of the entire limb, and suspected a central cause for the same. At this time the eye pit was in good condition, but in the face of a good appetite the animal had lost much flesh and was very sluggish in all his movements. He grew worse from day to day, when, on the 10th of September, I obtained the owner's consent to destroy him. Carefully removing his integument in the neighborhood of the face and fore limbs, I failed to find anything. I ordered the attendant to boil out the head and body and fore limbs. This revealed the presence of a misshapen rifle bullet at the anterior portion of the brain, about the point of emergence of the optic nerves, firmly imbedded in the nerve and brain tissue.

The meeting adjourned.

W. S. KOOKER, *Secretary*.

Kansas Veterinary Medical Association.—The annual meeting of the Kansas Veterinary Medical Association was held at Topeka, Kansas, September 17, 1891, at "The Copeland." The meeting was called to order by Pres. Pritchard. Minutes of previous meeting read and approved. Officers for the ensuing year were elected as follows : President, Dr. George C.

Pritchard, of Topeka ; Vice-President, Dr. S. L. Hunter, of Fort Leavenworth ; Secretary, Dr. N. S. Mayo, of Manhattan ; Treasurer, Dr. W. H. Richards, of Emporia. Board of Censors : Dr. J. M. Phillips, of Wichita. Dr. D. Le May, of Fort Riley, and Dr. L. R. Brady, of Manhattan.

The society then passed to the head of unfinished business. The resignation of Dr. C. S. Orr was laid upon the table until the next meeting. Drs. Hunter, Richards and Brady gave notice that a request would be made at the next meeting for a change of Sec. IV, of the Code of Ethics.

A paper on "Bursattee" was presented by Dr. S. E. Phillips, of Wichita, which was very interesting and thoroughly discussed. The subjects of Bovine Tuberculosis, Enzootic Cerebretis, and Hernia were brought up, discussed, and cases reported. Drs. Orr, Brady and Mayo extended an invitation for the association to hold its next meeting at Manhattan. The invitation was accepted and it was decided to make the meeting there the "banner" meeting, both in attendance and interest. The society then adjourned to meet in Manhattan the second Thursday in March, 1892.

N. S. MAYO, *Secretary*.

South Dakota Veterinary Medical Association.—On Sept. 24th, 1891, several of South Dakota's veterinarians assembled in the parlor of the Cataract Hotel, Sioux Falls, South Dakota, and organized an association which will be known as the South Dakota Veterinary Medical Association.

The objects of this association are the mutual advancement of its members in veterinary science, the cultivation of fraternity, the elevation of the profession and the diffusion of the knowledge of veterinary medicine and surgery. After an hour's time passed in hand-shaking and making acquaintance, order was called. A constitution and by-laws were then read, adopted, and signed by those present, after which the following officers were elected : President, Prof. C. A. Cary, B. S., D. V. M., Brookings, S. D. ; Vice-President, Dr. W. F. Heller, D. V. S., Sioux Falls, S. D. ; Secretary, Dr. D. B. McCapes, V. S., Vermillion, S. D. ; Treasurer, Dr. E. K. Paine, D. V. M., Sioux Falls, S. D.

The meeting then adjourned until next year when it is hoped there will be interesting topics before the association and much benefit derived.

D. V. CAPES, V. S., *Secretary*.

The Philadelphia Society of Veterinary Medicine.—The Philadelphia Society of Veterinary Medicine was organized at Philadelphia, on May 15th, 1891, by the adoption of constitution and by-laws, and the election of the following officers : President, Dr. Wm. H. Ridge ; Vice-President, Wm. Birch, V. S. ; General Secretary, E. H. Landes, V. M. D. ; Recording Secretary, J. J. Maher, V. M. D. ; Librarian, Howard Felton, V. M. D. Executive Committee : S. J. J. Hargar, V. M. D., G. R. Hartman, V. M. D., W. L. Zuill, M. D., V. S., Howard Felton, V. M. D. The object of the society is the reading of papers and the discussion of all subjects pertaining to veterinary and comparative medicine. The society starts with a strong and vigorous membership and has every promise of leading a useful and successful career.

The society held its first regular meeting on September 23, 1891, at the Veterinary Department of the University of Pennsylvania. Dr. W. H. Ridge, the president in the chair, and the following members and visitors were present: members—Drs. H. D. Entirkin, A. E. Conrow, M. E. Conrad, Leonard Pearson, C. H. Magili, Robert Formad, E. Bunting, Wm. L. Zuill; E. Muir, S. J. J. Hargar, E. H. Landes; visitors—John Marshall, M. D., and Dr. Kramer.

The subject that held the attention of the meeting was: "Tuberculosis and Koch Lymph as a Diagnostic Agent in Cattle," the report of the Tuberculosis Commission of the Veterinary Department of the University of Pennsylvania, was read by Dr. Wm. L. Zuill. Dr. Leonard Pearson gave a synopsis of the experiments that were conducted in Europe for the purpose of determining the diagnostic value of the lymph, and it was found that the results obtained were the same as those of the University Commission. The subject was thoroughly discussed by Drs. Zuill, Ridge, Formad, Hargar, and others, and it was agreed that the lymph did possess considerable diagnostic value.

The secretary was instructed to provide a permanent place of meeting, at the College of Physicians, if possible.

E. H. LANDES, *General Secretary.*

REVIEWS.

THE COMPARATIVE ANATOMY OF THE DOMESTICATED ANIMALS. By A. Chauveau, revised and enlarged, with the co-operation of S. Arloing; *Second English Edition*, translated and edited by George Fleming, C.B., L.L.D., F.R.C.V.S., etc. with 585 illustrations. D. Appleton and Co., New York, 1891. \$7.00.

This much needed second edition of Chauveau's anatomy is dedicated in commemoration of the centenary of the Royal Veterinary College, London and in memory of Charles Vial de Saint Bel. In seventeen years, since the first English edition was printed, the original French has seen three new editions. Considerable amendments, alterations and additions have been made in order to continue this invaluable work, as a complete text book and standard of reference for the veterinary student and practitioner. The anatomy of the ass, mule, rabbit and camel has been added and one hundred and thirty new illustrations aid the text and reference matter. A copious index renders the thousand and odd pages practical and accessible for review work by the student, and surgical reference by the busy practitioner. The translator has adopted the excellent system of having larger type for the more important parts and smaller type for those of less moment.

The veterinarian and comparative anatomist, alike, will find this anatomy an indispensable part of their library.

U. S. DEPARTMENT OF AGRICULTURE. Bureau of Animal Industry. Cause and Prevention of Swine Plague, by Theobald Smith, Ph.B., M.D. Twelve illustrations, colored. Government Printing Office.

The special report of the cause and prevention of swine plague, giving the result of experiments conducted under the direction of Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, this is a sequel to the special report on Hog cholera. The author, after a resumé of prior investigations of swine plague in other countries, and in Illinois and Iowa, Maryland and New Jersey, gives the result of his experiments, and draws his practical deductions. So much has recently been published in this JOURNAL in support of and against Dr. Smith's conclusions that further review is unnecessary. Every veterinarian should carefully study the original, which he can obtain by application to the Congressman of his district.

EPIDEMIC INFLUENZA; Notes on its origin and methods of spread. By Richard Sisley, M.D. Longmans, Green & Co., London and New York, 1891. \$2.50.

Influenza is treated from the standpoint of human medicine, and the author gives the various nomenclature; he then defines the disease; gives the origin, the method of its spread, and historical sketch of the epidemic in various countries and under diverse conditions, which lead to the conclusion of the contagiousness of its nature. Chapter XIII. treats of influenza in animals, but offers no proof that there is any identity or even analogy between the disease of man and that of the horse, known by the same name, beyond a few opinions without facts. He seems to confuse stranglers with influenza. It is an interesting book and well worth reading.

BOOKS AND PAMPHLETS RECEIVED.

On the Comparative Osteology of the United States Columbibæ, by R. W. Shufelt, C. M. Z. S., Rep. from the Pro. Zoo. Society, London.

Journal and Proceedings, Royal Society, New South Wales, Sidney, 1890.

Journal of the Asiatic Society of Bengal, Calcutta, 1891.

Verhandlungen des Naturhistorischen Vereines der preussischen Rhinlands, Westfalens und des Reg. Bezirks Osnabrüeck, Bonn, 1891.

Sitzungsberichte der Naturforscher Gessellschaft bei der Universitat Dorpat, 1891.

Mittheilungen des Naturwissenschaften Vereins für Steirmark Gratz, 1891.

Verhandlungen und Mittheilungen des Siebenburgischen Vereins für Naturwissenschaften in Hermannstadt.

Jahrbericht des Vereins für Naturwissenschaft zu Braunschweig, 1891.

Jenaische Zeitschrift für Naturwissenschaft herausgegeben von der medizinisch naturwissenschaftliche Gesellschaft zu Jena, 1891.

Jahresbricht der Gesaellschaft für natur und Heilkunde in Dresden, 1891.

Vierteljahrsschrift der Naturforschend Gessellschaft in Zurich, 1890-91.

Verhandlungen der Schweizerischen Naturforschenden Gesellschaft in Davos, 1891.

Compte Rendu des travaux présentés à la soixante-treizième session de la Societé Helvétique des Sciences Naturelles Davois, 1890.

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ECHINORHYNCHUS GIGAS AND ITS INTERMEDIATE HOST.

BY C. W. STILES, PH. D.

Bureau of Animal Industry,
Agricultural Department,
Division of Pathology,
Washington, D. C.

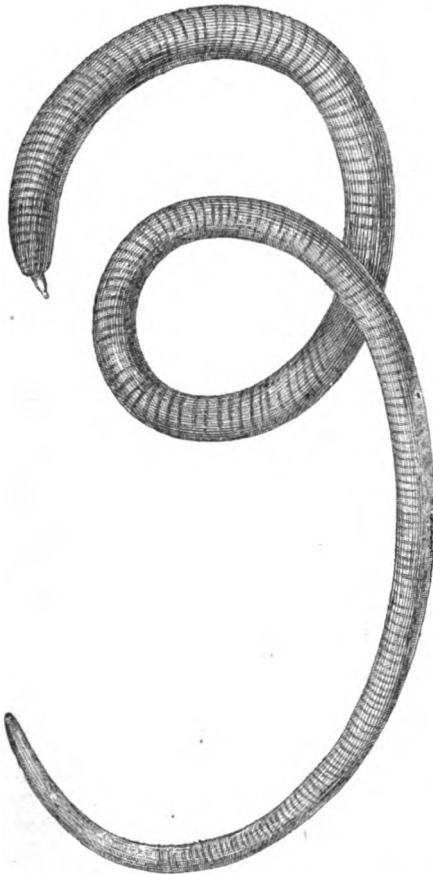


FIG. 1.—*Echinorhynchus gigas*, female,
natural size. (Railliet.)

Among the parasites of the hog is found one species of the genus *Echinorhynchus*—*E. gigas*. In its adult stage this worm inhabits the small, rarely the large, intestines, the rostellum (its anterior extremity) buried in the intestinal wall, its body floating in the lumen. The presence of a large number of these parasites undoubtedly causes more or less irritation in the digestive tract of the host, and according to many authors it is not rare that one or more specimens bore through the wall into the abdominal cavity, thus causing peritonitis. Frequently *E. gigas* is found associated with *Ascaris lumbricoides* in the same animal, and although

the two helminths are quite distinct, certain superficial observers have described *E. gigas* as *Asc. lumbricoides*. The following table will aid in determining the two species, so common in pigs :

	ECHINORHYNCHUS GIGAS.	ASCARIS LUMBRICOIDES.
Male, length	6. 5—9 cm.	15—25 cm.
Female, length	20.—50 (ave. 35) cm.	20—40 cm.
Color,	white.	yellowish.
Anterior ex- tremity,	with armed rostellum, 6 rows of 8 hooks each.	with three lips.
Intestine,	totally wanting.	present.
Female genital opening,	posterior extremity.	on boundary between first and second thirds of the body.
Male genital opening,	posterior extremity.	near end of tail.
Eggs,	elongated, almost cylindrical, 0.087—0.1 mm. long, smooth, containing hooked embryo.	ovoid, 0.05—0.06 mm. long, rugged, generally with- out embryo when found in the fæces.
Development,	indirect with change of host.	direct without intermediate host.

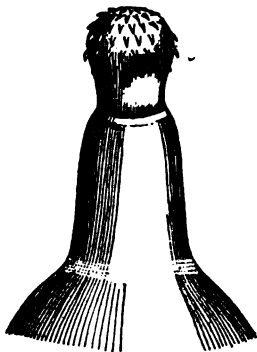


FIG. 2.

Cephalic extremity of *Echinorhynchus gigas*, enlarged ten diameters.
(Raillet.)

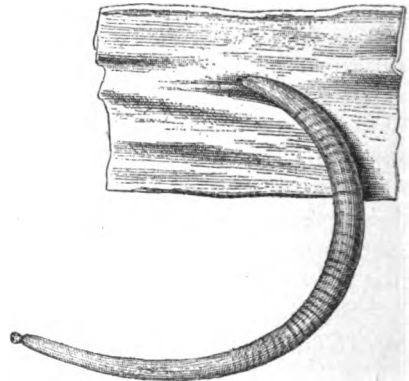


FIG. 3.

Echinorhynchus gigas, male, at-
tached to intestine of hog,
natural size. (Raillet.)

Further, *Ascaris* has a very peculiar odor which is not noticed in *Echinorhynchus*. A microscopical examination of the fæces of the hog, is the only sure method of determining the pres-

ence of *Echinorhynchus*. If the parasites are present their eggs will be found and easily identified.

After this short introduction as to the nature of the worm, I will give a brief review of some experiments conducted in the Bureau of Animal Industry to determine the source from which the hogs become infected. For further particulars in regard to the anatomy, etc., of the parasite, see Kaiser's Monograph on *Echinorhynchus* in R. Leuckart's *Bibliotheca Zoologica*, 1890.

In 1868 Schneider stated that *Melolontha vulgaris* acted as secondary host for this helminth. Later (1887) Kaiser demonstrated that *Cetonia aurata* was also able to act as secondary host, and he believes further that *C. aurata* forms the regular source of infection of this curious and dangerous parasite.

As neither of these insects are found in the United States, the work of Schneider and Kaiser, both of Germany, fails, of course, to explain how the American swine become infected with the parasite in question, which occurs in nearly all sections of the country.

Noticing that the hogs around Washington, D. C., very commonly contain *E. gigas*, I determined to find the American insect in which the larval form of the parasite develops. As experiment animals I selected "white grubs" of the genus *Lachnosterna* and, placing a number of them in a flower pot, I gave them tender roots, etc., to eat, upon which I had sprinkled hundreds of eggs which I took from several female worms. The infection was made September 5th. On dissecting the insect larvæ, October 20th, I found them enormously infested with larvæ of *Echinorhynchus* in various stages of development. From one grub I took at least three hundred parasitic echinorhynchi. As I examined some of the grubs before the experiment and found them free from the parasite and, as all the grubs examined later contained the characteristic larvæ, there seems to be no doubt that the experiment is positive.

Since making this infection I have learned from my friend, Mr. L. O. Howard, assistant entomologist of the Department, to whom I am indebted for the insects upon which I experimented, as well as for the entomological information in this paper, that it is the custom among many of our farmers to make use of their hogs in ridding their grounds of these grubs. If a portion of ground is found to be particularly infested with white grubs, the hogs are turned loose and destroy the grubs. This custom undoubtedly adds, to some extent, at least to the frequency of this

parasite among American hogs ; for, when a farmer feeds grubs to his hogs, he must necessarily feed them *Echinorhynchi* at the same time, provided the grubs are infected.

The white grub with which I have chiefly experimented, is the larva of *Lachnosterna arcuata*. According to Mr. Howard, this species has been reported from New York, New Jersey, District of Columbia, Georgia, Iowa and Missouri. The geographical distribution of the parasite in the United States is, however, very much greater than the distribution of this insect. It follows that *Lachnosterna arcuata* is not the only insect in America which can serve as the secondary host to our parasite. *L. dubia* has a much wider range than the former species, and Mr. Howard tells me that although it is practically impossible to distinguish the larval forms of the three species of *Lachnosterna*, I mention in this paper, he strongly mistrusts that I have both this and the following species among my experiment animals. Specimens of *L. dubia* are found in the National Museum, from Maine, Massachusetts, New York, New Jersey, District of Columbia, North Carolina, Ohio, Illinois, Wisconsin, Tennessee, Montana, Nevada, California and Texas. Another closely allied species, *L. hirticula* has been found in Massachusetts, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, North Carolina, Illinois, Missouri, Nebraska and Minnesota.

These three species of insect are included in the old species *Lachnosterna fusca*, Froehlich, and since they all have the same habits, feeding upon tender roots, etc., and each differ from one another only in their male genital organs, I assume provisionally that all three—in other words, Froehlich's *L. fusca*—can serve as secondary host for *E. gigas*, although I have given an absolutely positive demonstration only in the case of the first species, *L. arcuata*.

In all, ninety-one species of *Lachnosterna* are recognized in this country, and it seems to me highly probable that some of these other species may serve as secondary host for this parasite, although I have not as yet had an opportunity to experiment with them.

The typical group of the *Cetoniae* is represented in this country by the genus *Euphoria*, of which we have sixteen species represented in all parts of this country, except in California. Of the closely allied genera *Allorhina* and *Gymnetis*, we have two species each found mainly in the Southern States. I hope later, through the kindness of Dr. D. E. Salmon, chief of this Bureau,

to be able to extend my experiments to some of these other forms in order to determine whether only the *fusca* series of the *Lachnosterna* can serve as source of infection to our herds, or whether *E. gigas* can develop in other species of American insects as well.

Schneider's theory that *Melolontha vulgaris* is the secondary host of *E. gigas* in Europe, has met with some objection on the ground that this insect is essentially a phytophag, and not found in the dung heaps. *Lachnosterna* is also open to the same objection, but this objection it seems to me is only an apparent one, for the faeces of hogs are by no means confined to the dung heaps, but are found scattered over fields as well. Mr. Ashmead informs me that *Lachnosterna* grubs are found particularly frequent under the manure droppings in the fields, an occurrence which is very satisfactorily explained by the fact that the roots of plants under the manure patches are particularly tender. Now it is perfectly evident that if the eggs of *E. gigas* are contained in the manure dropped upon the fields, they will, in course of time, be washed into the ground directly under the patch, and get upon the young roots of the plants. Upon eating these roots the insect larvæ can very easily become infected with the eggs of the parasite. Thus I see no objection to considering a phytophagous insect as a normal intermediate host for our parasite. While I thus support Schneider's *Melolontha* theory, I do not, of course, intend to detract any from the work of my friend Dr. Kaiser, to whom we are indebted for the finest monograph as yet published on the subject of *Echinorhynchus*.

AGE OF THE HOG.*

The age of the hog is of much less importance than that of any of the domestic animals, as this animal becomes an article of commerce and is sent to the butcher the moment that the ratio of its increase of weight (flesh and fat) ceases to be greater than the proportionate cost of the food which is furnished to it. Even for breeding purposes, the hog is rarely kept to an advanced age. The question of its age only becomes important in exhibitions, where the judges must verify the age in the class for which the animal is entered.

From "Age of the Domestic Animals," by R. S. Huidekoper, M. D., Vet. Just published.

DENTITION.

Formula	{	Temporary,	$\frac{3 \cdot I \cdot 3}{3 \cdot I \cdot 3} = 28$
		Permanent,	$\frac{3 \cdot I \cdot 4 \cdot 3}{3 \cdot I \cdot 4 \cdot 3} = .44$

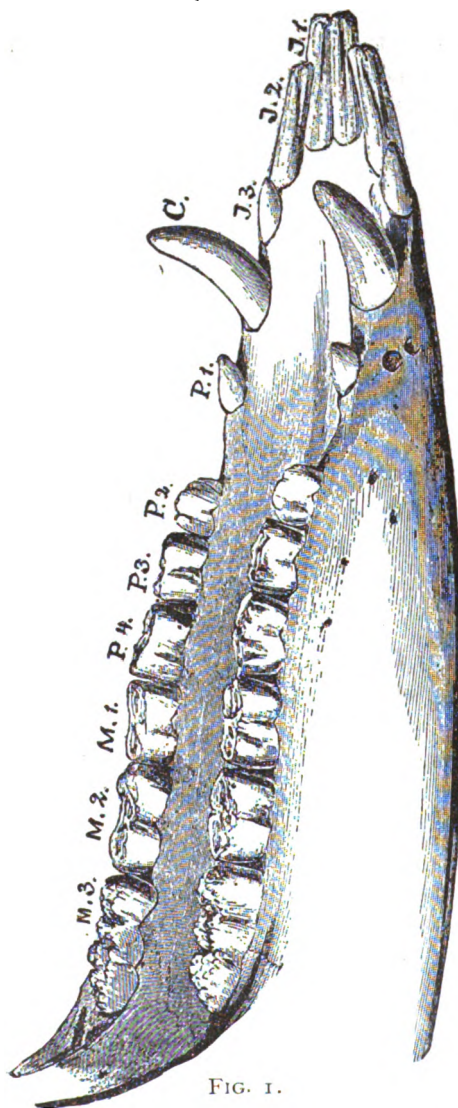


FIG. 1.

Low jaw of pig, showing permanent dentition.

The hog has forty-four teeth, six incisors in each jaw (12), two tusches in each jaw (4) and seven molars (which are subdivided into four pre-molars and three molars) in each arch of both jaws (28).

INCISORS.

The pinchers and intermediate teeth of the upper jaw are flattened from side to side, somewhat like those of the horse, as they also have a small dental cup; while those of the lower jaw are straight, rounded, and directed forward like the teeth of a rodent, with their extremities converging toward the median line. The corner teeth of both jaws are small, conical teeth, separated from the intermediate on the one side and from the tusks on the other. They have no cups, but often have three small tubercles like the incisors of the dog.

TUSKS.

The tusks are much more developed in the male than in the female ; they are prismatic in shape and curve outward and backward. In the wild hog they may attain an enormous length (six inches or more), pressing the upper lip upward and the lower lip downward and crossing each other in an X, the superior tusk passing behind the inferior ; the two frequently have their respective anterior and posterior faces much worn by the constant friction from their contact with each other. The tusks continue to grow throughout the life of the animal. The growth is diminished in the castrated male.

MOLARS.

The molars are divided into premolars and post-molars. The first premolar resembles very much the conical corner incisor tooth, but has two roots instead of one. It is placed in the interspace between the tusks and the other molars, being about twice as far from the latter as from the former.

The other molars are between the inferior molars of the horse and the molars of the dog in form. They wear by the centre of the crown and have not the irregular asperities found in the herbivora. They increase gradually in size from in front to behind, and are larger in the upper jaw than in the lower.

DETERMINATION OF AGE BY THE TEETH.

To Dr. Olof. Schwartzkopff I am indebted for the following :

"During the past few years many objections have been raised, on the part of our practical breeders, to the correctness of the older rules for recognizing the age of our domestic animals. Several cases of an extraordinarily early development of the dentition have been observed in fat-stock shows and other exhibitions, and it has been alleged that modern feeding, with the tendency to produce early maturity, results also in an earlier shedding of the teeth. Not only in the United States have these doubts been heard, but also in England and Germany. In 1882 Prof. G. T. Brown published, in the *Journal of the Royal Agricultural Society of England*, an article in which he comes to the conclusion that, as a general thing, the views of the breeders cannot be relied upon, and that the recognition of the age from the teeth is still the best and surest. In June, 1886, the Executive Committee of the Fat-Stock Show at Berlin preferred similar

complaints, and requested the Minister of Agriculture to introduce new experiments at the veterinary schools and agricultural experiment stations in Germany, to ascertain whether the signs of age from dentition, sexual development, and growth of horns can appear at an earlier time in our precocious breeds than hitherto believed. Accordingly, Prof. A. Nehring, of Berlin, published in the *Landwirtschaftliche Jahrbucher* of 1888, a series of new dentition tables for pigs, as a result of his studies and investigations upon a collection of one hundred and thirty-one skulls of different kinds of pigs, at the museum of the Royal Agricultural School at Berlin.

Having seen and examined parts of this collection, I will undertake to demonstrate, with the guide of the above-mentioned tables, together with my own experience and observation while practicing in breeding establishments, that our practical men have been quite right in many cases, and that the doubts to which reference has been made are not without foundation."

The pig, like the other animals, has two sets of teeth,—the temporary or milk teeth and the permanent ones.

"There exists a remarkable difference in the time occupied by the teeth in cutting their way through the gum and appearing on its surface, while the mode of succession remains unchanged. But it must be remembered that the dentition tables, still referred to in modern books for the practical pig breeder, are based upon observations made in times when the common pig was raised, or, perhaps, a breed more or less improved by English stock, and fed in the old fashioned style. Variations into early maturity were then described as abnormal ; but as soon as the pure breeding of the favorites of our day commenced, Berkshire, Poland, China, *et al.*, and we applied to them scientific feeding, we forced the animals into entirely new and artificial conditions, revealing the hitherto unknown physiological laws of early maturity."

The periods of age which can be determined by the dentition are divided into :

1. Eruption of the temporary teeth.
2. Eruption of the permanent teeth.
3. Wearing of the permanent teeth, after $2\frac{1}{2}$ or 3 years, an age attained but by few hogs.

These periods vary slightly, and when a latitude of time is given it is understood that the shorter is for precocious pigs and the longer for those races which approach the primitive pig.

FIRST PERIOD—ERUPTION OF THE TEMPORARY TEETH.

At Birth.—The pig is born with eight teeth,—the corner incisors of each jaw and the tusks. These teeth resemble each other very much, and probably serve to aid the tongue in sucking.

Four to Fourteen Days.—In the first two weeks the second upper molar and the third lower molar appear.

Two to Five Weeks.—During the next three weeks the second lower molar, the third upper molar, and the pinchers of both jaws accomplish their eruption.

Five Weeks to Three Months.—At about six weeks the intermediate incisors of the lower jaw appear, which are followed in two weeks by the intermediate incisors of the upper jaw.

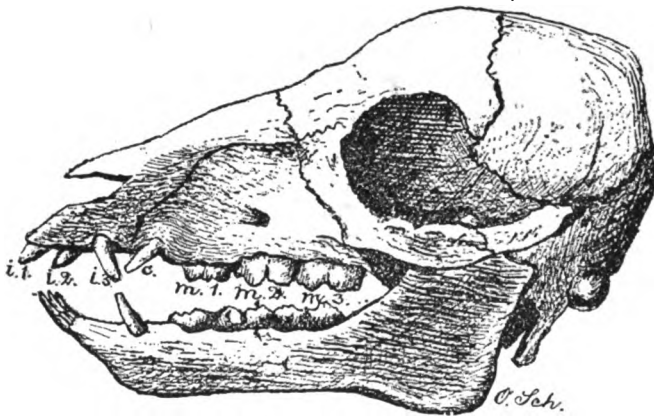


FIG. 2.

Skull of a three-month old pig with full milk dentition.

At three months the eruption of the temporary teeth is completed, and during the next few months the teeth become more or less worn, according to the character of food upon which the animal is nourished.

SECOND PERIOD—ERUPTION OF THE PERMANENT TEETH.

About Six Months.—Before the first half-year the first permanent molar (fifth) and the first premolar (wolf-tooth) in each jaw appear.

Nine Months.—Within a month of three quarters of a year the corner incisors and the tusks make their eruption, followed shortly by the second molars (sixth) of both jaws.

One Year.—At one year the lower pinchers protrude from the gums, preceding the superior pinchers by two to three months. At about this time, thirteen to fourteen months, the third and fourth premolars appear, followed a month later by the second premolar.

One and a Half Years.—At eighteen months the intermediate incisors of both jaws make their appearance, and simultaneously the eruption of the third molar (seventh) takes place.

After Two Years.—The incisor teeth become used with great irregularity, according to the nature of the food; the tusks increase in length and give some approximation of their age, but insufficiently to be accurate.

TABLE OF DENTITION OF THE HOG. (SCHWARTZKOPFF.)

MILK DENTITION.

TEETH.	PRECOCIOUS PIGS.	NORMAL TIME OF APPEARANCE.	PRIMITIVE PIGS.	SIMONDS.
Corners and Tusks.	Present at birth.	Present at birth.	At birth.
Pinchers.....	2 weeks.	3 to 4 weeks.	5 weeks.	1 month.
Intermediate ;				} 3 months
Upper jaw.....	8 weeks.	12 weeks.	16 weeks.	
Lower jaw.....	5 weeks.	8 weeks.	12 weeks.	
1st molar.....	5 weeks.	7 weeks.	9 weeks.	
2d molar;				
Upper jaw.....	4 days.	8 days.	14 days.	
Lower jaw.....	2 weeks.	3 to 4 weeks.	5 weeks.	
3d molar;				
Upper jaw.....	2 weeks.	3 to 4 weeks.	5 weeks.	
Lower jaw.....	4 days.	8 days.	14 days.	

PERMANENT DENTITION.

Pinchers.....	11 months.	12 months.	14 months.	12 months.
Intermediate.....	16 months.	18 months.	21 months.	18 months.
Corners.....	7½ to 8 months.	9 months.	10 months.	9 months.
Tusks.....	3½ months.	9 months.	10 months.	9 months.
1st premolar.....	2 to 3 months.	6 months.	6 months.	
2d premolar.....	13 months.	14 to 15 months.	16 months.	
3d premolar.....	12 months.	13 to 14 months.	15 months.	
4th premolar.....	12 months.	13 to 14 months.	16 months.	
1st molar.....	2 months.	5 months.	6 months.	
2d molar.....	7 to 8 months.	9 to 10 months.	12 to 14 mos.	
3d molar.....	17 months.	18 to 19 months.	20 to 22 mos.	

The following explanations of the causes influencing the variations in the dentition of the pig is given by Schwartzkopff:—

“The question now arises as to what may be regarded as the cause of this early dentition in modern pigs. We know that our present method of feeding causes a rapid development of the whole body, including, of course, the head. As the teeth could not possibly grow without a corresponding growth of the jaws, that produce them, we must conclude that the development of the skull is the primary cause or driving force in their development. Unconsciously, the modern feeder has produced here some highly interesting facts instructive to natural science at large. Hitherto zoologists have been of the opinion that the form of skull of a fixed species is unchangeable from generation to generation, we may say for thousands of years. This is correct as long as we think of individuals raised in the freedom of nature and under natural and similar circumstances. But domestication, with its forced feeding and breeding for various demands, has brought about unexpected changes in many respects, and is now evident that the form of skull does not rest merely upon heredity. Only a predisposition to a certain form of skull is transferable from parents to their offsprings, but whether exactly the same form will be transmitted depends to a greater extent upon the nutrition, and but little less upon the employment of the muscles of the head and neck. It is not only important that the nourishment be abundant and well selected, but it is also necessary that the individual be in a healthy condition, and his digestive apparatus in such working order as to be able to utilize the offered food equally well. This is plainly seen by comparing skulls from animals which were healthy and growing vigorously with those which received the same advantages of nutrition, but were suffering with a chronic disease. Continued weakness, caused either by disease or insufficient food, produces a long, slender skull, while the skull from a strong pig shows a remarkable

expansion in its latitude and altitude. The following reproductions, taken from originals in the agricultural museum at Berlin, will illustrate this point :—

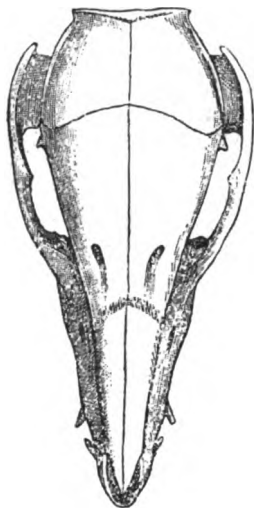


FIG. 3.

Skull of a three-month-old pig which died from tuberculosis.
(Half natural size.)

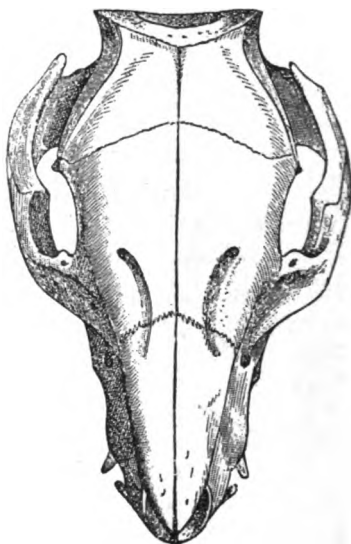


FIG. 4.

Skull of two-month-old healthy and well-fed pig.
(Half natural size.)

“ Besides the nutrition influence, a strong or weak muscular action plays an important part in the production of form. The pulling and pressure of muscles extensively used for certain purposes, especially those of the head and neck, will give the head a characteristic shape. Pigs which are prevented from rooting will acquire a short, high, and rounded head, while those which are forced to root to secure a portion of their food will develop a long and slender form of head. If we force both experiments to the greatest degree possible, we shall produce those extremes which distinguish the wild pig from our improved races. That this is true is proven by the fact that when our domestic hogs are returned to absolute liberty, it will require but a few generations to reproduce the original skull of the wild pig. And, *vice versa*, we have called into existence, from the primitive hog, all those different representative types of our day by careful and continued selection, gradual assortment, and particular attention to the desired qualities of form, size, etc.

The striking difference between the skull of a primitive hog and a modern one is seen in the following illustration :—

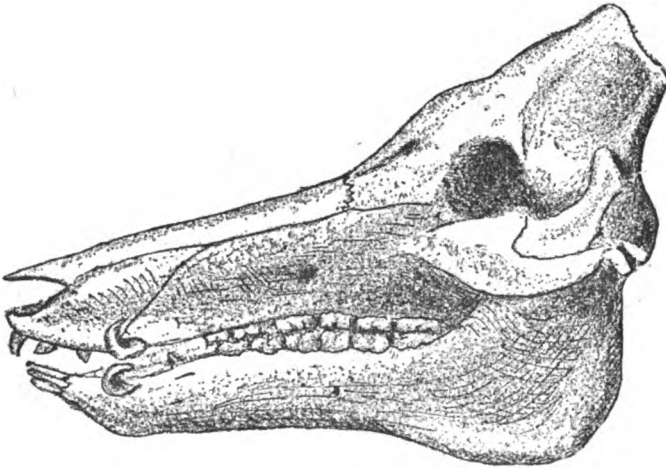


FIG. 5.
Skull of a full-grown primitive Texas boar.

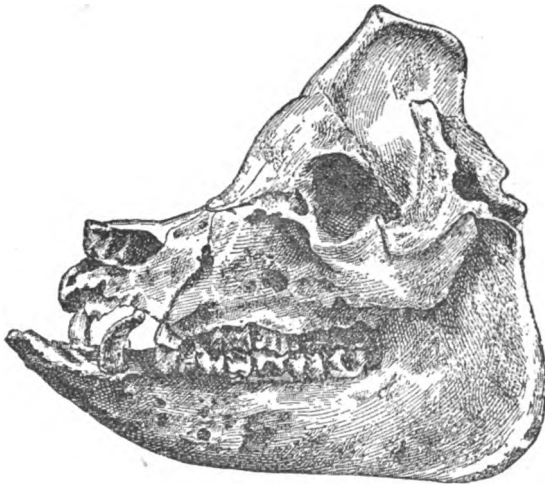


FIG. 6.
Skull of a full-grown sow of the small Yorkshire breed.

“The pig has, perhaps, the most elastic and changeable organization of any of our domestic animals. It also has the advantage of being able to digest all kinds of food as an

omnivorous animal, and last, though not least, it multiplies more rapidly than any domestic animal,—even the sheep. Therefore, it has been at all times regarded, and promptly too, as the animal *par excellence* for experiments in breeding, and the pig is the best example of what men have accomplished in the production of animals.

“Drawing, now, the conclusions from the above examinations, I shall summarize them in the following theses:—

“1. The order of succession of the teeth in our precocious pigs remains the same as in the primitive hog.

“2. The times when the teeth appear are variable, according to the race, feeding, and health. The same breeds, raised under the same conditions, will show the same appearance.

“3. The form of the skull depends upon nutrition, health, and more or less employment of certain muscles of the head and neck.”

AGE OF THE DOG.

FROM SAME.

The age of the dog is a matter of considerable importance. While the well-bred hunting-dogs, hounds, setters, and pointers, and those of other races which are kept for breeding purposes, have almost invariably a verified and registered pedigree, which is stereotyped on the end of the owner's tongue, with the date of the animal's birth, yet there are large a number of dogs, especially of the races which are kept for house-dogs and pets, which, from their appearance, are of undoubted good breeding, but which, from change of owners by sale, theft, or in the many other ways peculiar to dogs, lose their records. In view of the great prices which these animals sometimes bring, it becomes needful to at least approximately determine their age and to estimate the number of years which they still have to live, and will be of use to their owners. The smaller races of dogs usually live to a greater age than the larger. The Mastiff, St. Bernard, and Great Dane rarely exceed the age of ten years; the hound, setter, and pointer may live two or three years longer, and the terriers have been known to live to seventeen, nineteen and twenty-two years of age.

DENTITION.

Formula	{	Temporary,	$\frac{3 \cdot 1 \cdot 3}{3 \cdot 1 \cdot 4} = 30$
		Permanent,	$\frac{3 \cdot 1 \cdot 3 \cdot 3}{3 \cdot 1 \cdot 4 \cdot 3} = 42$

The dog has forty-two teeth,—twenty in the upper jaw and twenty-two in the lower. They are divided like those of the other animals into incisors, tusks, and molars, the latter again subdivided into premolars and post-molars.

INCISORS.

There are six incisors in each jaw, known as the *pinchers*, *intermediate*, and *corner* teeth. Those of the upper jaw are larger than those of the lower; the corner teeth are the largest, the intermediate are next in size, and the pinchers are the smallest. The incisor teeth have a large crown, on the extremity of which there are three eminences or tubercles, that in the centre being the largest, which gives it somewhat the form of a clover leaf, or *fleur de lis*. The internal face is beveled off and separated from the root of the tooth by a distinct ridge. The external face is convex in both directions, and is smooth and shiny. The root is very large, it is flattened from side to side, and is separated from the crown by a well-developed neck. The root is very firmly imbedded in the deep alveolar cavities. The virgin root contains a large dental pulp-cavity, which, however, becomes obliterated at an early period. When the incisors are worn by the friction of food and the thousand-and-one foreign bodies, which the dog "handles" with its mouth, the central tubercle is first used, then the lateral tubercles, and last the whole crown is worn, showing an irregular table of dentine, surrounded by enamel, and having in its centre a dark spot corresponding to the obliterated dental cavity.

The surface of the teeth is of a brilliant white in the dog, they are not covered with cement as in the other animals. The temporary and permanent incisors are alike in form and shape, but the former are very much smaller than the latter, and, as the head and jaw of the young dog are relatively large, the temporary incisors cannot occupy the whole arch, and so have spaces between them showing the gum, while the larger, permanent teeth when virgin are just in contact with each other by their free extremities.

TUSKS.

The dog has four tusks which are very prominent, and give the name of *canine teeth* to the corresponding teeth which resemble them in the other animals. They are placed one each side of each jaw, dividing the space between the incisive arch and the arches of the molars, unevenly; the inferior tusks are nearer to the incisive arch, while the superior ones are nearer the molars, and when the jaws are closed the tusks cross each other, coming in contact by the postero-external surface of the inferior tusk and the antero-internal face of the superior tusk. The temporary tusks are smaller, longer, more curved, and more pointed than the permanent ones.

MOLARS.

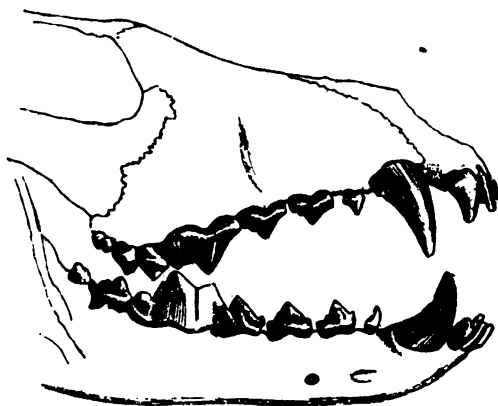


FIG. 1.

Permanent dentition of the dog.

There are six molars in each arch of the upper jaw and seven in each arch of the lower. They increase in size from the first premolar to the fourth of the upper jaw, and to the first post-molar (fifth of the lower jaw), and then diminish in size at the next to last and last molar. They have large, bulbous crowns with pointed eminences, which serve

for the tearing rather than the grinding of food. In the upper jaw the first three premolars are unilobular, the last is bilobular, and the last two post-molars have flat crowns. In the lower jaw the four premolars are unilobular, the first molar has three eminences, and the last two have two.

When the teeth of the dog have accomplished their eruption, they cease to grow and their roots remain firmly fixed in the alveolar cavities.

In the first dentition only the premolars are found; the post-molars appear as permanent teeth.

The molars in the dog do not form simple arches as in the other animals, but each arch represents a double curve; so that

the two arches on either jaw make the form of a lyre, with its base backward and its apex forward, the widest portion of which is on a line between the last premolar and the first molar. The form or curve of the arches varies considerably with the different races of

dogs, and increases greatly in those breeds which, by domestication, have had their heads and maxillæ shortened. These changes may almost approach the nature of a deformity, and the last premolar and first molar may be crowded entirely out of the line of the other teeth, or may be absent, as is sometimes seen in the pug or fancy bulldogs.

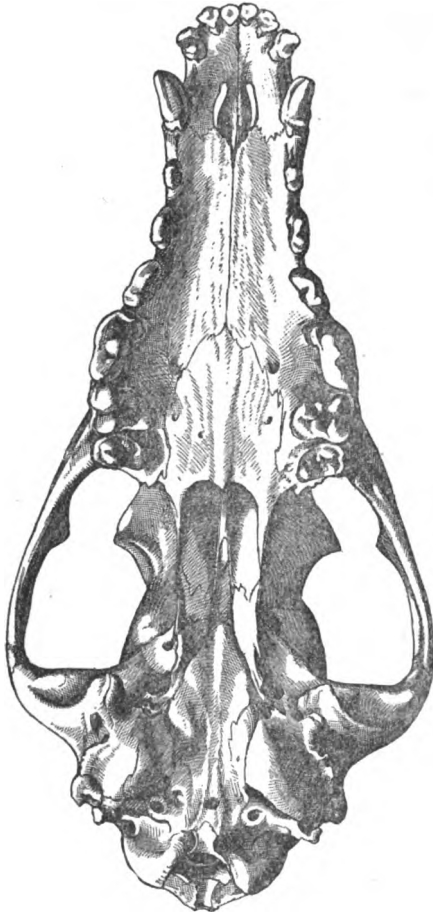


FIG. 2.

Skull of a greyhound, under surface.

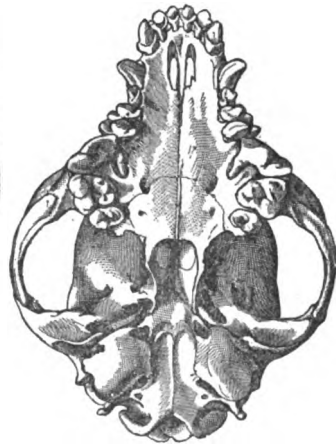


FIG. 3.

Skull of a pug, under surface.

Dr. James A. Waugh informs me that in the Mexican hairless dogs the teeth are generally irregular in number and relative position in the jaws. They have no tubercles or trefoils on the table surface of the incisor teeth. They have no canine teeth, or tushes, in either jaw. He has met with some half-breeds that had canine teeth in the upper or the lower jaw, but found no cases

with those teeth in both jaws. The molars vary in number and relative position in different animals. The development of the adult dentition is much slower and later than in other classes of dogs.

One Mexican hairless dog, aged 2 years, had five superior incisors, no canine teeth, two superior molars on each side, one large molar and one very small molar behind the large one; two inferior incisors, no canine teeth, two inferior molars on each side, one large molar and one very small molar behind the large one. Total number of teeth, 15.

A Mexican hairless bitch, aged 2 years, had four superior incisors in front and one on right side midway between the front teeth and the molars, no canine teeth, two superior molars on each side, one small molar and one large molar behind the smaller one, seven inferior incisors in front, and two on each side midway between the front teeth and the molars, no canine teeth, two inferior molars on each side, one large molar and one small molar behind the large one. Total number of teeth, 24.

DETERMINATION OF AGE BY THE TEETH.

From the evidences furnished by the teeth the age is divided into three periods :—

1. Eruption of the temporary teeth.
2. Eruption of the permanent teeth.
3. Wearing of the permanent teeth.

ERUPTION OF THE TEMPORARY TEETH.

At Birth.—Puppies may be born with all of their temporary teeth, but if the teeth have not appeared the eruption commences at once by incisors and tusks of the upper jaw, and the entire dentition is effected within the first three weeks at longest. (Fig. 4.)

Two to Four Months.—A month before the eruption of the permanent teeth the temporary pinchers and often the intermediate teeth in both jaws become loose and fall out; at this time the points of the permanent teeth can be felt by pressing on the gums. (Fig. 5.)

ERUPTION OF THE PERMANENT TEETH.

The permanent teeth replace those of first dentition several months earlier in the large races of dog than in the terrier varieties. Medium-sized dogs, setters, etc., make the change later than the large dogs and earlier than the terriers.

Five to Eight Months.—According to the race of dog, the permanent teeth appear rapidly in the following order: pinchers, intermediate, corners, and tusks. The incisors do not come out obliquely, as in the herbivora. It is worthy of note that, while the herbivora do not have all of their permanent dentition until they have arrived at their full development of body, the carnivora have theirs long before they have attained their growth and before the consolidation of their bones.

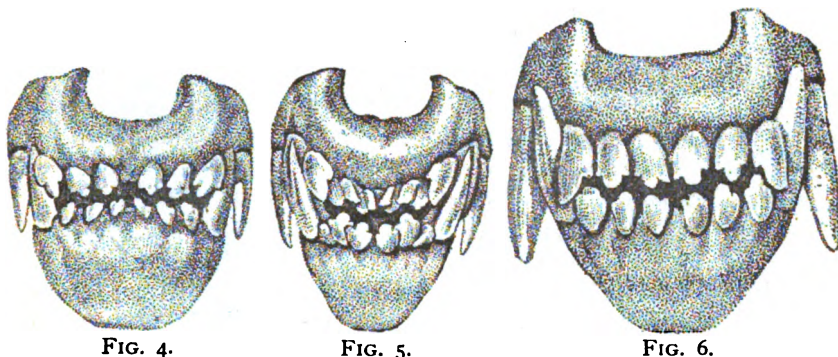


FIG. 4.—Teeth of puppy two months old.

FIG. 5.—Teeth of dog four months old; the incisors are loose and ready to fall out.

FIG. 6.—Teeth of dog one year old, showing the incisors and tusks fresh and unworn.

One Year.—For the first few months after their appearance there is no alteration in the teeth; at one year they are pure white and the tubercles on the incisors are intact. (Fig. 6.)

Fifteen Months. From fifteen months on, commences the wearing away of the teeth. This is first seen on the inferior pinchers, while the tusks and other teeth remain fresh and white in color.

Eighteen Months to Two Years.—At about this time the tubercles of the inferior pinchers become worn down and those of the other incisors commence to be used. (Fig. 7.)

Two and One-half Years to Three Years.—After two and a half years the tubercles of the inferior intermediate teeth are worn away, the incisors of the upper jaw shows signs of use, and all of the teeth commence to lose their fresh, white appearance and become yellowish and discolored. (Fig. 8.)

Three and One-half Years to Four Years.—The pinchers of the upper jaw become worn down and are followed by the wearing of the superior intermediate teeth.

The discoloration of the teeth increases and the tusks become yellow and dirty in appearance.

After this the leveled and broken teeth give no indication of the age. A Great Dane, which for twelve years had only been fed at the table on tid-bits, and a poodle of thirteen years, had teeth as fresh as those of an ordinary dog at four or five; and bull-terriers and others at four or five may have the incisors nearly worn away.

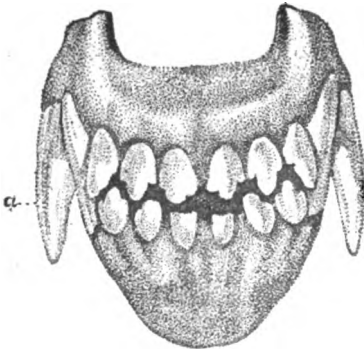


FIG. 7.

Teeth of dog eighteenth months old, showing use of the inferior pinchers. The tusches are still fresh and white.

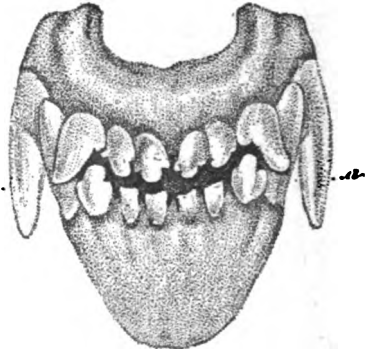


FIG. 8.

Teeth of dog two and a half years old, showing use of inferior pinchers and intermediate teeth.

The leveling of the teeth of the dog consists of the wearing away of the middle tubercle to the level of the lateral tubercles and the wearing of the enamel from these. As we have just seen, the leveling commences with the inferior pinchers, is followed by that of the inferior intermediate teeth, and does not commence on the superior incisors until it is complete on the inferior ones; with the superior incisors it commences with the pinchers and follows with the intermediate teeth; the tusks do not commence to wear until the use of the incisors is marked. The leveling of the teeth may, however, take place much more rapidly or more slowly than has been indicated above, and may even be very irregular in the teeth which it first effects, according to the nature of the food upon which the animal is nourished.

Dogs fed on meat and those which have bones to know use their teeth more rapidly than those which are fed on soups, broken bread, and vegetables. Dogs which are pugnacious, and those which are taught to swing on ropes or straps and to fetch objects, such as sticks, stones, etc., use their teeth rapidly and are apt to have their tusks much worn. These dogs also frequently have irregular mouths, from broken teeth. From these causes it sometimes happens, especially with the larger dogs, that the teeth are so altered after three years that no intelligible deduction can be drawn from the appearance of the mouth.



FIG. 9.

Teeth of dog over three years old, showing use of all of the incisors; the tushes are becoming yellow.



FIG. 10.

Teeth of an old dog; all of the incisors and tushes are much used and worn.

DETERMINATION OF AGE FROM OTHER SIGNS.

The young dog is born with its eyelids closed; these do not open until the ninth or tenth and sometimes as late as the fifteenth day.

Young dogs have heads which are large in proportion to the size of the face.

Old dogs become gray around the nose, eyes, and forehead; their noses become larger, and the skin over the whole face becomes wrinkled. The lips become everted and show the red mucous membrane along their irregular borders. The skin, at the ordinary points of pressure in decubitus, especially in large dogs, become denuded of hair and develops an epithelial growth which is almost horny in character; so that in old dogs we find callous point at the elbow, hock, salient points of the pelvis, and sometimes on the shoulder.

PREPARATION OF AN ANIMAL SUTURE.

BY D. A. JOHNSON, D. V. M.

It is a conceded fact that sutures made from animal tissue are preferable to those made of silk. After some experiments with silk, catgut, and other sutures, I conceived the idea of utilizing the tissues of the tendons of the horse for sutures. Taking one of the perforatus tendons from a mare that had died from a rupture of one of the iliac arteries in trying to foal, I placed it in a strong corrosive sublimate solution for one week; then I separated the tendon into fine threads, which I twisted by rolling on a clean board with the hand; then with a sharp knife removed the rough points caused by broken fibres. After having thus dressed the threads I placed them in a bottle containing olive oil three parts, and carbolic acid one part. The bottle was then tightly corked and set away for two weeks. Then the sutures were placed in another bottle containing olive oil and tannic acid—one drachm of the acid to the ounce of oil. This bottle was tightly corked and allowed to stand for two weeks; the sutures were then ready for use.

The corrosive sublimate and carbolic acid thoroughly disinfect the sutures, the tannic acid toughens them, and the olive oil keeps them soft and pliable. It is very difficult to get the threads as smooth as the catgut, and of late I have not attempted this, for when they are kept in the oil they are so pliable that they can be used conveniently if they are a little rough. Prepared as above delineated it takes four or five weeks for their absorption, in a closed cavity; or, as buried sutures. It is easier to tear the threads out of dried tendons, but they are more readily absorbed. These threads answer equally well for ligatures.

PILOCARPINE AS A PURGATIVE FOR THE HORSE.

BY SAME.

Pilocarpine Hydrochlorate given hypodermically is a good hydragogue purgative for the horse. It is a mild systemic stimulant, excites the activity of the glandular structures, especially the parotid glands and those of the intestinal tract, and stimulates peristalsis, thus causing the discharge of watery fæces.

Thus used it is especially valuable in cases of intestinal impaction, when the alvine excretions are liable to become hard and dry ; and in cases where gastric distention has produced intestinal paralysis.

When given hypodermically in doses of one to three grains it should produce a copious flow of saliva in three to five minutes, and an action of the bowels in twenty minutes to one hour, and if it does not the dose should be repeated.

In certain cases it may be well to combine eserine with the pilocarpine, yet much caution should be exercised in the use of this combination, and as eserine is a powerful sedative I have nearly discarded its use.

In comparison the two drugs are as follows :

PILOCARPINE.	ESERINE.
General stimulant.	Powerful sedative.
Increases the heart's action.	Decreases the heart's action.
Mildly stimulates peristalsis.	Powerful peristaltic stimulant.
Lowers temperature.	Increases temperature.
Produces watery fæces.	Does not alter the character of the fæces.

Thus it is seen that eserine is a much more powerful drug than pilocarpine, and will always produce more or less depression; consequently it should never be used when the action of the heart is weak, as is often the case in colic and indigestion.

While in pilocarpine we have a remedy that can be pushed, and in so doing we get the purgative action, and gain two points, *i. e.*, an increased action of the heart, and a lowering of the temperature ; and, by its sudorific action it lessens the tendency to congestion of the bowels.

Prof. Niles has demonstrated that eserine, in doses of three grains, will cause the discharge of watery fæces, while smaller doses do not alter the character of the fæces.

TATTOO FOR SHEEP MARKING.

BY J. B. HELLIER.

This way of marking stud sheep for the purpose of keeping up the register of their pedigrees, has been in use in the stud flocks of Europe, America, and Australia for many years past. The tattoo method is now, however, coming into use, for marking

sheep as a guide to ownership and identification. The ordinary way of tattooing stud sheep is to put the tattoo mark or number on the ear. The instrument used for this purpose is a small tongs-like implement, the figures or letters being fixed in one blade or side of the tongs. The letters are pricked into the ear, and soot or India ink rubbed in, so that there should be formed a black tattooed letter on the ear.

It is now proposed to mark the sheep under similar regulations as those of the Registered Brands Act, the tattoo marks to be put on in the following order, to indicate ownership :

First mark, - - -	The near or left ear.
Second mark, - - -	The off or right ear.
Third mark, - - -	Under side of the tail.
Fourth mark, - - -	Under the near fore arm.

The last tattoo mark to be considered the mark of the present owner, as in the case of the succession of brands under the Registration of Brands Act.

It has been found that if the letters are stamped on an ink pad, just like the stamps are inked at the post office that the tattooing is effective, and the letters and figures become as indelible as when the ink or soot is rubbed in, in the usual way.

The tattoo stamp can be used without the tongs or pliers, and a private mark made on any sheep which would secure the identification of the sheep or their skins even when the ears are cut off, the sheep shorn, or the brand mark blotched or defaced.

The great similarity of a great number of ear marks, too, and the ease with which they can be altered, or, as the Australians say, *faked*, often stands in the way of easy and certain identification.

For the protection of the tattoo mark on the ear of the sheep, any wilful disfigurement of the mark involves a penalty not exceeding £100, and a thief who cuts off the sheep's ear is severely punished. In fact, where the tattoo is used as a brand mark, sheep or sheep skins without ears are deemed subjects for strict police investigation.

Anyone who has to identify sheep and goats and their skins will see at once the value of tattoo marking ; and I think its general adoption would aid in the detection of thefts, and everything which facilitates the catching and conviction of thieves is an additional help to the putting down of stock stealing.—(*Agricultural Journal*, Cape Colony.)

ELECTRICAL ACCIDENTS TO DOMESTIC ANIMALS.

BY JAMES A. WAUGH, V. S.
Alleghany, Pa.

The application and utilization of electricity as a motor-power for street railway coaches, and the use of cheap or badly constructed or defective arrangements in road-beds, prove sources of occasional serious accidental electrical injuries to horses that are driven over these car-tracks, and come in contact with rails, which have become sur-charged with an excess of electricity due to a settling or sinking of the road-bed and breaking of the underground wires, which cause breaks in the electric circuits.

Horses are often injured by attempting to cross from one set of tracks to another while cars are approaching in opposite directions, and especially when approaching river-bridges. The horse happens to step with one fore and one hind foot, or both fore and hind feet at the same time on the inside rails of the double tracks, and the metallic shoes on the horses feet act as conductors which transmit the electricity to the animal and causes it to rear or spring several feet up into the air, and then fall prostrate on the street; while other cases are shocked so severely that they fall prostrate and remain paralyzed. The character of the injury is in proportion to the amount of electricity received, intensified by violent contact with the street. The shock may be so severe as to cause instant death or only partial paralysis with almost complete prostration for a few hours or several days, weeks or months. The pulse is slow, feeble and irregular; nostrils dilated, respiration slow and laborious; temperature slightly elevated; pupils dilated or contracted, the eyes present a peculiar and unnatural expression, while sometimes strabismus is present, and at other times the eyelids are paralyzed: perspiration rather free in the early stages; mastication and deglutition impaired, some patients will require an hour or more to drink a pail of water. The head is sometimes held almost in a line with the neck or twisted on one side with the eye pointing toward the ground; one ear may be held erect while the other is lopped and paralyzed. Locomotion is seriously impaired and the animal stands with its feet wide apart as if trying to brace and steady itself, and when moved the feet are raised only a slight distance from the ground; sometimes the patient is unable to assume a standing position, while others

walk and act somewhat like human beings affected with *locomotor ataxia*, staggers from side to side, if hurried falls down and turns somersaults in all directions. The animal appears much frightened and nervous and there may be a well-marked quivering of certain sets of muscles for several days or weeks after the accident. The functions of the digestive and urinary organs are somewhat impaired in the early stages but soon regain their normal condition. The nerve cells are seriously injured and the functions of the nervous system is impaired and sometimes permanently damaged.

I have not yet had an opportunity for post-mortem examinations on this subject, but Dr. Jackson informed me that Dr. Jennings and himself had found well-marked congestion of the mesenteric glands in a horse which had been killed by an electric shock received on street-car tracks, and heart greatly hypertrophied, which probably accounts for the sudden death. Elevated wires are sometimes displaced and prove fatal to horses which come in contact with them.

Treatment consists in hypodermic injections of strychnia, atropine, digitaline, and administration of stimulents and restoratives, either in drenches or enemas. It is sometimes necessary to secure and confine the patient in slings for several weeks or months, but mild cases usually do nicely in comfortable box-stalls. Feed and water from high mangers. Tonics and alteratives are beneficial during convalescence, which is generally tardy and unsatisfactory. The owners usually desire post-mortem examinations of horses killed by electricity; while horses severely shocked and injured are generally treated for some time in order that damages may be legally recovered from the traction company. A few cases may be cited to illustrate the above remarks. I have had a case under treatment and observation for about four months and it is not yet well enough to walk out of the stable; although the companies veterinarian diagnosed it as a simple case of pleurisy which would recover in a few days, while two of the ablest veterinarians in the city were called in as evidence and confirmed my diagnosis—electric shock.

Dr. J. C. McNeil, kindly showed me a horse which had been shocked about a year ago and was driven three miles to the country, the patient suffered severely and was unable to control his actions and it was found necessary to confine him in slings for a period of twenty-one weeks, This horse is not yet fit for any work.

I saw a large heavy draft horse that was shocked early last winter, and the owner finally became discouraged and gave the horse away to a farmer. There is a great variety of mild forms of electrical injuries which appear to cause a reduced or increased function of certain sets of muscles of locomotion, especially the abductors, flexors, and extensors of the posterior extremities.

SUCCESSFUL LARYNGOTOMY FOR LARYNGISMUS PARALYTICUS.

BY S. J. J. HARGER, V. M. D.

As the value of any operation can best be determined by compiling statistics from cases occurring in the experience of individual practitioners, I will take the opportunity of reporting the following case. The patient, a bay coach-horse, 16-3 hands high and about twelve years of age, was sent to the veterinary department of the University of Pennsylvania by Dr. Wm. H. Ridge. He had been a roarer for three months without any apparent cause, and was gradually becoming worse. Ordinary exercise for one square developed a loud laryngeal sound. Blisters and alterations were employed, but without effect. Feeling certain that there was a paralysis of the laryngeal muscles on the left side, from pressure on the corresponding recurrent nerve, laryngotomy was the only remedy. Instead of etherization, two ounces of choral hydrate were administered, which answered the same purpose.

After making an incision into the larynx in front and on the median line in the usual manner, the tampon canula was inserted and the left arytenoid cartilage carefully dissected out and dislocated from the cricoid. The mucous membrane was incised very close to the border of the arytenoid, in order to leave as much of the former as possible. The vocal cord was cut off close at its attachment to the latter and left in place. After the hæmorrhage was arrested, the laryngeal cavity was packed with oakum sprinkled with iodoform and the external incision closed with three sutures. The following day, the sutures and packing were removed, the laryngeal cavity washed out with carbolyzed water and the canula taken out. The breathing was slightly noisy, which disappeared in a few days. Daily washing out with

the syringe and the application of iodoform constituted the after-treatment. The discharge was small and the wound healed kindly, without exuberant granulations. Three weeks after the operation, the external incision had closed, and slight exercise developed no noise. At the end of six weeks, the animal was able to do his usual, severe work without any indication of roaring.

The diagnosis of muscular paralysis was verified after opening the larynx, by the almost complete relaxation of the left vocal cord during aspiration.

In this case, I did not suture together the edges of the mucous membrane, which, however, I shall do in all my future operations of this kind. The great barrier to success in these cases has been the formation of excessive granulation from the large area of muscular tissue exposed. This can be prevented by uniting the edges of the mucous membrane with two or three sutures of cat-gut. Neglecting this procedure leads most frequently to failure; heeding it has been the great element of success to Möller.

I read an article in the November number of the *JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES* referring to the difficulty of dissecting the mucous membrane from the arytenoid cartilage in Möller's operation. This operator simply incises this membrane very closely around the circumference of the cartilage, and then draws the incised edges together with sutures.

CASES.

RABIES.

By J. F. Winchester, D. V. S.
Laurence, Mass.

During the week of July, 1890, a bull terrier dog, owned here in town, was bitten by a dog that was running amuck through the highway. The bite was not a severe one, and no special notice was taken of it, but the owner asked me within a few days what was the chance of his dog becoming rabid.

The result of the opinion I expressed was that the animal was under close confinement for a period of about three months, and as he remained in an apparently normal condition, the restriction was removed.

Nothing was observed abnormal until the middle of May, 1891, and on the 17th he was excitable and irritable, and bit a dog that had been his companion for some time. The wound was made over the eye, and had the appearance of being made with one tooth. As a result of that he was again chained in the hay loft, and then began a series of symptoms that would cease only from exhaustion, or the presence of the groom. Barking, tearing anything within reach, breaking windows and sash, and at one time broke his chain. When approached by the groom he would stop and crouch with only quick breathing to be noticed. This condition lasted three days, and he was found dead one morning.

Post mortem : Rigor mortis well marked. The abdominal viscera normal with the exception of the contents of the stomach, which consisted of foreign matter.

The organs in thoracic cavity normal. The blood vessels under the pia mater in the convolutions of the brain were congested, and also the plexi in the three ventricles.

The dog that was bitten May 17 died June 12, having been sick a few days, and the owner told me he had the same actions as the dog that bit him. Prescribed during his sickness.

PERITONITIS AND ABNORMAL SPLEEN.

Oct. 1. Castrated chestnut colt 17 months old. The manipulation easy and soon over. Colt got up all right, no bleeding, put in box stall, tied up, given hay to eat.

Oct. 3. Visited the colt. He was bright, active, good appetite, full of life, and it required some tact to open the scrotum, which was done, and the usual amount of serum was found.

Oct. 12. Was called and found colt dead at noon.

History : Saturday, the 10th, he was apparently all right, eating well and good spirits, not any unusual degree of swelling of scrotum, the openings discharging well. Sunday the 11th, did not feel well, but ate until evening. No marked pain, but his head was down and dull. Monday, the 12th, up and down during the morning, but no pawing or acute pain, and at noon he died without a struggle.

Post Mortem : Chestnut gelding 17 months old. Not bloated, body warm, well marked rigor mortis, scrotum somewhat swollen, holes open and discharging apparently normal pus. Removing abdominal muscles found the peritoneum inflamed, and opening the same, serum poured out copiously. The small colon was blushed light red in color, the same with the large colon. The

small intestines were very red, of deep carmine color, and peritoneum dark red, and the blood vessels in the peritoneum were filled and well defined.

On the right side and under the stomach found an organ, shaped like the spleen, weighing about three pounds, dark blue in color, spongy texture; the capsule on side next stomach ruptured and covered with coagulated fibrin.

On left side and underneath (on top, as animal was on its back) found a spleen, weighing about two pounds, normal in shape, color and texture.

The rest of viscera apparently normal.

PERITONITIS AND DEATH AS A RESULT OF RUPTURE OF THE EXTERNAL COAT OF THE STOMACH.

History : Animal sick all night with colic. Called to see the horse in morning, found animal down, pulseless, cold sweat, and diagnosed peritonitis with the prognosis of death within a short time.

Post mortem twenty-four hours after death. Black roan gelding. Tympanitis well marked. Removed the abdominal muscles, found peritoneum dark in color, blood vessels well dilated, and a large amount of straw-colored serum in abdominal cavity. The large and small colon were normal in color with the exception of a slight light red blush, which was also found on the small intestines.

The stomach was distended and a rupture of the external coat along the large curvature for nearly two feet. The muscular fibers of the middle coat were separated and well defined. The rest of viscera normal.

FISTULA OF STENO'S DUCT.

Last spring the owner of the horse in question noticed that the animal did not take the bit as kindly as had been his habit, and acted as if his mouth was sore. Within a short time the horse was brought to me, and an examination of the buccal cavity disclosed that the third upper molar was diseased and the outside edges were very pointed; this condition was remedied, and the animal returned to work with apparent relief.

Two or three weeks after this the owner noticed an enlargement on the left side under the jaw bone, which gradually increased in size until it broke, and a continual stream of clear, thin fluid escaped. This condition the owner tried in vain to control for

about three weeks, and then the animal was again brought to my notice.

At once recognizing the trouble, I began to look for the cause, and examining the mouth found that the mucus membrane on the left side of the mouth opposite the third upper molar was corrugated and inflamed. Thinking that the cause of the trouble might originate there I tried to pass a catheter while the animal was standing, but failed to accomplish the feat. Sent the horse home, and had him prepared for casting, and the catheter was passed into the duct down as far as where it runs under the bone and then the animal was allowed to get up.

The opening under the jaw was kept clean, and a strong solution of carbolic acid applied to the part several times a day.

The result of this was that the discharge stopped after a short time, and at time of writing the animal is apparently all right, with the exception that the course of the duct is well defined back to the gland.

TORSION OF THE LEFT LAYERS OF THE LARGE COLON IN THE HORSE.*

BY S. J. J. HARGER.

Professor of Anatomy and Zootechnics in the Veterinary Department of the University of Pennsylvania.

At the Congress of Naturalists in Bremen, in 1890, Jelkmann first called attention to the feasibility of, not only diagnosing, in the live animal, a volvulus or torsion of the large colon, but also of treating it by operative means. The importance of this statement is apparent from the frequency of occurrence and the fatality of the alteration. According to Jelkmann's communication, of 192 cases of colic in the horse, seventy suffered from torsion of the folded colon. In twenty-three post-mortems on similar cases, death could in ten be traced to a volvulus of the folded colon. The veterinary statistics of the Prussian army, received in 1886 thirteen, in 1887 twenty-seven, in 1888 thirty-seven, and in 1889 eighty-four death from volvulus. Much credit is due to Jelkmann

* Monatshefte für Practische Thierheilkunde, by Prof. Dr. Möller, of Berlin.

for his careful observation upon this point, and, if his statements are doubted, this is in part excusable from the fact of an insufficient anatomical knowledge by many observers and the indifference with which operative measures have been regarded.

The torsion of the large colon here described, which, according to his remarks, as a rule takes place toward the right, is primarily due to an excessive distension, (especially of the third portion and its pelvic flexure). When the animal, lying down, suddenly rises, the upper layer of the colon, already pushed toward the median line of the abdomen, turns downward, and rotates on its own axis. While this explanation is, in my opinion, significant, it must nevertheless be admitted that the opposite may happen, *i. e.*, torsion toward the left side; in a case under my observation, the twist was in this direction. The post-mortem records of the local Anatomico-Pathological Institute also confirm it. Sometimes the colon is displaced toward the left, sometimes toward the right. Its relative length often filled with dry contents as well as its extensive mobility in situ explains the frequent displacements.

The symptoms of this alteration are not characteristic; nevertheless, its diagnosis per rectum is not very difficult. Beside the colicky pain, which is moderate but progressively increasing from hour to hour, the diminished peristaltic movements of the intestines, and a small and feeble pulse, the hand introduced into the rectum gives the best information as to the cause of the symptoms. Toward the entrance of the pelvic, the hand can recognize the colon very much distended, which at first can be confounded with the distended bladder. A more critical examination will, however, reveal that it is the large colon. The longitudinal bands of this intestine not only confirm this, but also indicate the direction of the torsion, right or left. In normal conditions, this direction is horizontal, in the direction of the body. In torsion, a change in this direction is distinguished; from before and outwardly, backward and inward, in torsion to the right, and the opposite, when it is toward the left.

Jelkmann states, also, that the great mesentery, whose root from the sub-lumbar region can be outlined, feels more tense, and, in right torsion, instead of being suspended perpendicularly, slants towards the left. Displacing the intestine causes pain. Moreover, the longitudinal bands of the colon are of greater diagnostic value; as soon as they are located, the existence as well as the direction of the torsion are beyond doubt. They need not be confounded

with the posterior band on the distended cæcum; the latter can be distinguished by its curvature backward toward the external angle of the right ilium and its termination at the base of the organ.

I have convinced myself of these relations by experiments on the cadaver. The latter being placed in the natural position, the left flank, between the external angle of the ilium, the transverse processes of the lumbar vertebræ and the last rib, was removed. This gave a clear view of the relations of the organs in the postero-abdominal and pelvic cavities. The large colon was then strongly inflated *in situ*, or, after having made the twist, filled with water. The hand per rectum was easily controlled, and could distinguish the relation of the veins, organs, as well as the parts which it touched.

A torsion being now made, the altered conditions could be appreciated and a reposition effected. This proved to me that it is especially necessary to recognize the direction of the colic bands, and, so much more, as the great mesentery is but little displaced. On the contrary, the examination of the form leaves no doubt as to the diagnosis.

Such a displacement of the colon, which does not disappear spontaneously, unless in extremely rare cases from the animal's rolling, always calls for grave prognosis. Hence, the value of the question, is the reduction of the torsion in all cases possible, and, if so, how can it be accomplished? Jelkmann says that, in many instances, success can be obtained. I have convinced myself that this is possible. Great muscular power and endurance are required, although experience will greatly facilitate it.

An injection of luke-warm water per rectum is first administered to empty the small colon and give room for the hand to work. Jelkmann introduces the left hand into the rectum, directed toward the left flank, and endeavors to push the left (inferior) layers of the large colon, here mixed up with the convolutions of the small colon, forward and toward the middle of the abdominal cavity. Having reached this point, he slowly carries the hand upward, when the colon falls back into its normal position above the hand; while the left lower convolutions of the small colon are being pushed upward, the large colon can fall back into its normal situation. My experiments confirm the success of this operation.

I have had the occasion to reduce a torsion of the colon toward the left side in the following manner: After the small colon was washed out, the right hand followed per rectum the

colic bands from in front and inwardly, backward and outward, *i. e.*, backward and to the left. The upper band was then firmly grasped between the palmer surface of the thumb and fingers, and after repeated adductive movements I succeeded finally in drawing it so far to the right as to effect a reduction of the displacement. At this moment, the distension of the pelvic flexure diminished, peristalsis returned, and the small, frequent pulse disappeared; half an hour afterward recovery was insured. As I determined experimentally, the middle band of the inferior surface formed the point of support for the retroversion of a torsion to the left side.

Displacements of the colon cannot be treated after the same and invariable procedure; differences in displacements require variations in the treatment. But, the attention being drawn to the subject, a little experience will enable me to adapt the treatment to individual cases. Perhaps puncture of the distended colon will render the operation more easy.

To explain the preceeding remarks, I may cite the following case : On the 8th of June, I was called to see a heavy draft-horse, which had suffered from colic for twenty hours, during which time no food and but little water had been taken. The examination revealed, moderate but continued uneasiness; the horse laid down and rose frequently, walked to and fro in the stall, and showed all the signs of intestinal impaction, pulse 65, small and weak; respiration 30 per minute and shallow; tympanitis of the posterior part of the abdomen; peristalsis weak, with long pauses, and only on the right side; general sweating, no passage from the bowels, excepting three small balls. Examination per rectum showed the pelvic flexure of the large colon greatly distended with gas, and pushed into the pelvic cavity. On the lateral surface of the colon a strong, tense cord was felt extending from in front, below and inwardly, backward, upward, and outward; a similar cord was outlined on the middle surface of the colon. The bladder contained but little urine.

The hand, per rectum, was directed in the manner described above toward the cord on the lateral surface, and after several laborious attempts, it succeeded in drawing the band toward the median line of the abdomen. This was immediately followed by normal peristalsis, escape of gas, and, very soon a discharge of fæces, the uneasiness ceased, the pulse and the mucous membranes became normal. After an hour recovery was almost complete.

REVIEW OF RECENT PUBLICATIONS IN MEDICAL ZOOLOGY.

BY C. W. STILES, PH. D. Washington, D. C.

General.

Dr. O. Deffke. Die Entozoen des Hundes II. (Archiv für wiss. u. prakt. Thierheilkunde, xvii. 1891. p. 253-289.) In this article, published after the author's death, we find some very interesting and important statistics in regard to the internal parasites of dogs, in Berlin, Prussia. Two hundred dogs, killed at the veterinary school, were examined for parasites. The general results of the investigation are as follows:

1. The following species of internal parasites are known to exist in dogs: *Protozoa*: *Cercomonas intestinalis* (Lamb); *Coccidium perforans* (R. Lkt); *Coccidium bigeminum* (Stiles); (see below). *Vermes*: *Distoma campanulatum* (Ercolani); *D. felinum* (Rivolta); *D. conjunctum* (Cobbold); *D. echinatum* (Generali); *Hemistomum alatum* (Diesing); *Bothriocephalus latius* (Bremaer); *B. cordatus* (Leuckart); *B. serratus* (Dies.); *B. fuscus* (Krabbe); *Taenia echinococcus* (v. Siebold); *T. cucumerina* (Bloch); *T. marginata* (Batsch); *T. serrata* (Goeze); *T. coenurus* (Kuchenm); *T. Krabbei* (Moniez); *T. lineata* (Goeze); *T. serialis* (Baillet); *Echinococcus polymorphus* (Hartmann); *Cysticercus cellulosae* (Rud); *C. pisiformis* (Zeder); *Ascaris marginata* (Mystax) (Rud); *Oxyuris vermicularis* (Rud); *Eustrongylus gigas* (Dies.); *Strongylus canis bronchialis* (Osler); *S. vasorum* (Baillet); *S. canium* (Erc.); *Dochmius duodenalis* (Dubini); *D. trigonocephalus* (Rud.); *D. stenocephalus* (Rud.); *Trichina spiralis* (Owen); *Trichocephalus depressusculus* (Rud.); *Trichosoma plica* (Rud.); *Filaria immitis* (Leidy); *F. sanguinolenta* (Schneider); *F. medinensis* (Ginelin); *F. trispinulosa* (Gescheidt); *F. bronchialis* (Blmbrg); *Nemacodeum canis familiaris* (Warren); *Ver nématoïde du rein du chien* (Vâlpin); *Echinorinco del cane* (Perroncito); *E. grassi* (Grassi). *Arthropoda*: *Pentastomum taenioides* (Rud.); Larva of *musca cadaverina*; *Sarcophaga carnaria*; *S. hemorrhoidalis*; *Necrodes litoralis*.

2. The dogs of Berlin are comparatively free from Entozoa.

3. *Taenia marginata*, *T. serrata* and *T. coenurus* were found to be the most frequent.

4. *T. echinococcus* and *Pent. taenioides* were also quite frequent.

5. The following dogs were most frequently infected: *a.* Large races, hounds (Doggen); *b.* one year old dogs and very old dogs; *c.* the males; *d.* poorly nourished dogs.

One of the parasites mentioned is *coccidium perforans* Lkt., frequently found in the intestines of the rabbit. I have, myself, examined a large number of dogs but have never found this species. Ralliet and I found *Coc. bigeminum* Stiles '91, very prevalent in Parisian dogs and it is not impossible that Deffke has mistaken this species for *C., perforans*. If such, however, is not the case, I can add one more parasite to Deffke's list.

The statement that poorly nourished are more frequently infected than others is possibly open to criticism. The presence of the parasite will undoubtedly explain the poor condition of many of the dogs, in other words the parasites are the direct cause of the apparently poor nourishment of the animals.

Protozoa:

Dr. Anton Sticker: *Die gefahren der protozoen der Schlachthiere fur den Menschen* (Archiv f. animalische Nahrungsmittelkunde, VI., 1891, No. 2, p. 18-20; 6-7, p. 85-86; 10, 131-132). In the above named article Dr. Sticker brings forward no original results, but in a neat review of the work of other investigators, he describes the development, so far as known, of some of the microscopic parasites, in such a manner that the necessity of further original work on the subject will be apparent to the large class of people into whose hands his article must necessarily fall. He describes briefly the *Coccidia*, the *Sporidia* (*Micro-Sarco*, and *Sarcosporidia*) and *Haemogregarina* (falsely called by him the *gregarina*.)

In one place we read, "the *gregarina* belong to the true blood-parasites, which undergo their development inside the red blood corpuscles," etc., p. 133. This should undoubtedly read "to the *gregarina* belong, etc.," since the term *gregarina*, as used by the zoologists, includes a vast number of parasitic protozoa which develop in the intestines and other organs of animals, such for instance, as *Clepsidrina blattarum* in the intestinal canal of the roach, *Monocystis agilis* in the testes of the earth-worm, etc. The term *Haemogregarina* has been employed by many authors to designate the parasites of the red-blood corpuscles.

Dr. Sticker calls special attention to the important work done by Dr. Theobald Smith on the blood parasites in Texas fever.

Dr. Smith's discoveries in Texas fever and Prof. Laserau's discovery of the blood parasites in malaria, are described by Sticker as the most important discoveries yet made on the subject of pathogenic protozoa.

It occurs to me that Dr. Sticker lays altogether too much stress upon the dangerous character of the small cysts found in the muscular fibres of various animals and known as Sarcosporidia. So far as is yet known, these parasites are perfectly harmless to man. To prove this fact, the late Prof. Cobbold, ate a portion of meat containing thousands of these spores. Sticker dwells at some length upon the negative results obtained by Dr. L. Pfeiffer, from feeding meat infected with sarcosporidia to various animals. I have found these sarcosporidia very frequent in American and French animals, (pigs, sheep, cattle.) From April 1, to April 15, 1891, out of twenty-four sheep which I examined at the Pasteur Institute in Paris, I found twelve infected with *Sarcocystis tenella* and two with *Gigantea*. Numerous experiments followed for several months, gave only negative results, and have led me to the belief that the so-called semi-lunar disc must undergo some further change outside the body of the host, before it can infect a new animal. From hundreds of cases examined I have never found anything to support the view advanced by a certain German author, that a large number of individuals can become encysted together—in other words that some of the cysts result from a double or multiple infection. On the contrary, I believe that every cyst develops from a single spore. The authors have been somewhat divided as to whether the cyst wall is ciliated, pierced with pores or finely annulated. The cuticle of all the cysts I have examined were very finely annulated. If care is taken to isolate the sarcosporidia from the muscle fibre, the minute lines of annulation on the cyst wall are very distinctly seen. Caustic potash brings them still more clearly to view. In the middle portion of the cyst the lines run at right angles to the longitudinal axis of the parasites. At the two extremities where the cyst wall is somewhat thicker, the lines incline V-shape towards the median line.

Dr. Pfeiffer has laid great stress upon the reaction of the semi-lunar discs with Essin, but I have not been able to confirm his results. Further, a number of authors report that they have seen spontaneous movements of these bodies; I have studied the discs for hours at a time in bouillon, normal salt solution, water, and aqueous humor taken from sheep's eyes, both in the warmed

chamber and at ordinary temperature but I have never yet been able to convince myself of any spontaneous motion of the bodies in question. I have seen movements, even such movements as L. Pfeiffer describes, but they were certainly caused by outside influences such for instance as the movement of the liquid under the cover-glass, etc. The body which is called the nucleus by many authors, is according to my observation a vacuole. Generally only one vacuole is present, occasionally two are seen; they fail to respond to typical nuclear stains, methyl-blue, etc.

For full bibliography of the Sporozoa, to which all the animals treated in Dr. Sticker's article belong, (see Pfeiffer, Zeitschrift f. Hygiene, R. Blanchard, Bull. d. l., Soc. Zool. d. France, 1887, and Laserau, Du Paludisme et de son Hématozoaire 1891).

Vermes :

Deffke, Die Entozoen des Hundes (mit 2, Tafeln), I. (Arch. f. w. u. pr. Thierheilkunde, 1891. xvii., p. 1-60.) Deffke compares minutely, both anatomically and histologically the three tape-worms, *Tænia marginata*, *T. serrata* and *T. coenurus*. The work is well done, the description very clear and the figures finely executed. From his work. I will give only the following comparison of the three forms, which will enable one to easily distinguish the species from one another :

	TAENIA MARGINATA.	T. SERRATA.	T. COENURUS.
Size.....	1.5-5 m. long, the longest of the three species.	60 cm.-2 m.	40-60 cm., the shortest of the three species.
Head.....	Kidney form, 1 mm. in diameter.	1.3 mm. in diameter.	Pearshape 0.8 mm. in diameter.
Hooks.....	Slender, 36-48 in number.	Largest of the three species, 38-48 in number.	short, stout, 28.
Neck.....	Not prominent.	Prominent.	Not very prominent.
Caudal edge of segments.....	Extends <i>slightly</i> over the next following segment, like a cuff.	Prominent. Gives a saw-like appearance to the worm.	Not as prominent as in <i>T. serrata</i> .
Size of segments..	10-15 mm. by 4-5 mm.	8-10 mm. by 3-4 mm.	5-8 mm. by 3 mm.
Number of testes..	About 600.	About 400.	About 200.
No. of branches to uterus.....	5-6 (8) each side.	8-10 each side.	18-26 each side.
Eggs.....	Oval 38.5 u by 34.5 u.	37.5 u by 32.5 u.	35 v by 30 v.
Larve.....	Cysticercus longicollis.	Cyst. plisiformis.	Coenurus cerebralis.
Intermediate Host.....	Sheep, cattle.	Rabbit.	Lambs, calves.

M. G. Neumann. Observations sûr les Ténias du Mouton (Soc. d'Hist. nat. de Toulouse 18 Mars. 1891).

Prof. Neumann gives the following table to aid in the determination of the tapeworms of sheep.

Two genital pores in each segment.			
I.	A.—	Posterior border of segments fringed.....	1 <i>T. Ambriata.</i>
		Posterior border of segments slightly undulated..	
	B.—	a. Segments broad (10-25 mm.), transparent, always much wider than long.....	2 <i>T. Expansa.</i>
		b. Segments thick, opaque, becoming longer than wide (10 mm. or more long).....	3 <i>T. alba.</i>
		c. Segments thick, opaque, always wider than long.....	4 <i>T. Benedeni</i>
One genital pore to each segment.			
II.	A.—	Ripe segments longer than wide.....	5 <i>T. Vogti.</i>
		Segments always wider than long.....	
	B.—	a. Ripe segments 5-10 m.m. wide.....	6 <i>T. orilla.</i> (<i>T. giardi.</i>) (<i>T. aculeata.</i>)
		b. Ripe segments 1-2 mm. wide.....	
		{ b' Opaque in the median line.....	7 <i>T. centripunctata.</i>
		{ b'' Transparent in the median line.....	8 <i>T. globipunctata.</i> (<i>T. oripunctata.</i>)

Prof. Railliet. Invasion du Foie et du Poumon, chez un Porcelet, par un nombre immense de Larves du *Tænia marginata* in Recueil de Médecine, Vétérinaire publié à l'école d' Alfort viii. No. 14, 1891. Pp. 370-373. Prof. Railliet exhibited to the Veterinary Society portions of the lungs and liver of a two-months old pig, heavily infected with cysticercus tenuicollis, (the larval form of *tænia marginata*, one of the dog tape-worms). The cysts measured 5-6 mm. long by 1-2 mm. wide, and were 15-20 days old. The pig had swallowed a portion of a tape-worm passed by some dog. Similar cases of infections of pigs by this cyst have been reported by R. Leuckart and Zschokke: In all cases the animals died of peritonitis and pleurisy caused by the emigration of the young cysticerci which migrated from the lungs and liver in order to complete their larval development in the serous portions of the body

The cases cited in this review add new evidence to the importance of keeping our domestic dogs free from parasites if we wish to avoid introducing certain parasitical diseases among our flocks or even into our families. We have been wont to look upon "old dog Tray" as the most faithful friend we have; yet with all his faithfulness, he is the constant source of infection of a number of parasites. A little extra care in keeping the dogs clean and free from tapeworms, etc., will not only increase his usefulness but will sometimes prevent heavy losses in our live stock. *Tænia echinococcus*, a small tapeworm, *Tænia cœnurus*—the adult form of *cœnurus*, and *Pentastomum (Singuatula) tænioides*, a worm-like arachnoid which lives in the nasal cavities of dogs—are of rare

occurrence in this country; probably the few cases of these parasites which have been reported in the United States were either imported or came from recently imported stock.

Persons importing dogs from Europe, especially from Russia, Germany and Scandinavia, or from Iceland, should make sure that the animals imported do not harbor these parasites; in this way, we can prevent the importation of the corresponding diseases. A simple microscopic examination of the fæces will generally determine the presence or absence of *Tænia echinococcus* or *Tænia cœnurus*, and if the slime of the nose is examined microscopically, we can generally determine whether *Pentastomum tænioides* is present, their eggs can be discovered in the microscopical preparation. In which case, the dogs should be subjected to a thorough medical treatment and the fæces burned or still better, the dogs should be killed and burned in toto.

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C. B. Michener..... 1303 Q St., N. W., Washington, D. C.
F. L. Kilborne.. Department of Agriculture, Washington.

PUBLICATION.

W. H. Hoskins..... 12 S. 37th St., Philadelphia, Pa.
S. E. Weber..... Lancaster, Pennsylvania.
W. S. Kooker..... 457 N. 4th St., Philadelphia, Pa.

SPECIAL COMMITTEE ON FOOD INSPECTION.

Olof Schwartzkopf, Cor. 4th & 14th Ave. S.E., Minneapolis, Minn.
G. C. Faville. 210 Paul St., Baltimore.
W. Bryden..... 26 Sudbury St., Boston, Mass.

RESIDENT STATE SECRETARIES, 1891-92.

(No representative)..... California.
G. W. Pope..... 809 Government St., Mobile, Alabama.
Harrison Whitney..... Norwalk, Connecticut.
C. A. Cary..... Brookings, South Dakota.
H. P. Eves..... Wilmington, Delaware.
E. S. Walmer. 3229 M St., Georgetown, D. C.
(No representative)..... Atlanta, Georgia
A. J. Thomson..... Terre Haute, Ind.
E. C. Hollingsworth..... La Salle, Illinois.
S. Stewart..... Council Bluffs, Iowa.
D. Lemay..... Fort Riley, Kansas.
James L. Kidd..... Lexington, Kentucky.
(No representative)..... Indian Territory.
J. L. Russell Orono, Maine.
L. H. Howard..... 1440 Washington St., Boston, Mass.
E. A. A. Grange..... Lansing, Michigan.
H. N. Waller..... Windom, Minnesota.
M. A. Piche Fort Custer, Montana.
John S. Meyer..... St. Joseph, Missouri.
A. W. Clement..... 111 W. Franklin St., Baltimore, Md.
T. P. Turner..... Fort Niobrara, Nebraska.
William H. Lowe..... Paterson, New Jersey.

W. T. Russell.....	Nashua, New Hampshire.
Wm. R. Howe.....	Dayton, Ohio.
Jno. Wende.....	1593 Main St., Buffalo, N. Y.
C. D. McMurdo.....	Fort Sill, Oklahoma Territory.
W. S. Kooker....	457 N. 4th St., Philadelphia, Pa.
Jas. A. McLaughlin.....	1 Waterman St., Providence, R. I.
B. McInnes.....	Charleston, South Carolina.
J. W. Schiebler.....	312 3rd St., Memphis, Tennessee.
(No representative) ...	Vermont.
John A. Myers.....	Harrisonburg, Virginia.
S. B. Nelson.....	Spokane Falls, Washington.
E. D. Roberts.....	Janesville, Wisconsin.

FOREIGN CORRESPONDING SECRETARIES.

J. H. Frinck	St. Johns, N. B.
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CENTENARIES OF VETERINARY SCHOOLS.

LONDON AND MILAN.

Two great Veterinary schools have just completed their century of existence, and as is customary upon such occasions have called upon their friends to aid them in celebrating the events. We, Americans, as descendents of the Anglo-Saxon race, with affiliations with the English, and with many M. R. C. V. Ss. among our leading Veterinarians, and prominent in the Veterinary history of this country, naturally take a warmer personal interest in the centenary of the Royal Veterinary College (London), than we do in the more distant School of the Latin race at Milan. But if we put to one side our egotistical race pride and view the matter from the standpoint of Veterinary Scientists, should we do so. When we look at the gatherings at the two centenaries we find that our English School awakened but a local interest, for a day, although honored by the presence of the highest member of Royalty of the land, His Royal Highness the Prince of Wales, while that at Milan called for a congress of several days of the great Scientists of Europe, who came to honor the work of the century, which had done so much to advance, not only the Veterinary profession, but medical science at large.

The Centenary celebration of the Royal Veterinary College, London, was made the occasion of opening the new wing of the

institution, Field-Marshal His Royal Highness the Duke of Cambridge, Commander-in-Chief, and President of the College, presided. He was supported by His Royal Highness the Prince of Wales, the Vice-Presidents and Governors of the Institution, representatives of the Royal Agricultural Society, and celebrities in Agriculture, Medicine and in the Veterinary profession. The President toasted the Queen and the Prince of Wales, and was responded to by the latter, who expressed his satisfaction at the results obtained and his interest in an institution which had done so much for agriculture and the army. He concluded with the following toast : " Success and continued prosperity to the institution. It affords me the greatest pleasure to couple with it the name of your principal, Professor Brown, whose long professional career at the college and his connection with the Government Veterinary Department are well known to you all, and whose services were rewarded by the Queen on the occasion of her Jubilee by the Companionship of the Order of the Bath."

Professor Brown responded calling attention to the advanced scientific and social status of the Veterinarian.

A sketch of the founding of the Royal College and its history during the first quarter century of its existence, will be interesting.

THE ROYAL VETERINARY COLLEGE.*

On April 8th, 1791, the meeting was held at which it was determined to found a Veterinary College in London. The Duke of Northumberland was President, and other noblemen and gentlemen subscribed liberally to give effect to the scheme. Charles Vial de St. Bel was appointed Professor to the contemplated institution, and a Committee was formed to carry out the scheme. John Hunter, Mr. Cline, Sir Joseph Banks, Dr. Crawford, and other leading members of the medical profession, gave their assistance, and very full public approbation followed.

A piece of ground covering some acres in St. Pancras was taken on a long lease from the Earl of Camden, and arrangements made for building a lecture theatre, a dissecting room, stabling for fifty horses, and a strong forge. This was only a temporary plan, for St. Bel had much grander ideas of what a college should

* The Veterinary Record, October, 1891.

be ; he had been trained in the Government schools of France, and desired that the English school should be founded on a similar basis. His curriculum would have extended over three years, and all domestic animals would have obtained attention ; but St. Bel's scheme was too large for the private efforts of his subscribers, and too far advanced for the public of his day. The stables, the forge and lecture theatre were, however, completed, and on January 1st, 1792, a course of lectures was commenced. It was not till January 1st, 1793, that the infirmary was opened for patients, and then in a few days every stall was occupied. Ten students had joined the classes, and the anatomy of the horse was studied in the dissecting room. Amongst the students were men who left a mark on the profession, and whose names are worth remembering—they were Messrs. Bloxam, Blaine, R. Laurence, Field, and Bracy Clark.

Unfortunately the money subscribed to found the College was lavishly spent, and the buildings were not completed. Difficulties arose, and subscribers who began by being over-sanguine ended by being disappointed and suspicious. This, says Bracy Clark, "was shortly after followed by an event which for a time seemed likely to terminate the misfortunes of the College, and its existence ; this was no less than the death of our professor." The death of St. Bel took place in August, 1793, and the affairs of the College became gloomy indeed : creditors were pressing, and it seemed at one time that the institution must come to an end—for no one equally qualified could be found to take the place of St. Bel. We are told by Bracy Clark that "the pupils, being left without a teacher, were unable to make any considerable progress in their studies. In this position a very generous offer was made them by several of the most celebrated professors of human anatomy and medicine in London, which was to attend their lectures free of all expense. The lecture rooms of Dr. Fordyce, Dr. Baillie, Mr. Hunter, and Mr. Cruikshank, were now open to them, and most of them, with much industry availed themselves of the offer."

During this interregnum the practice of the College was carried on by the elder pupils, and Mr. Richard Laurence deserves to be remembered as the individual who practically succeeded St. Bel, and remained in charge until the Governing Committee found a successor to the first principal. The financial condition of the school had reached its lowest point, and the Committee were threatened with lawsuits by the creditors. At this juncture

a meeting was called, and the Earl of Morton and Lord Heathfield again gave their assistance. John Hunter also gave his influence and money, and the College was resuscitated. In 1794 the directorship was entrusted to Messrs. Moorcroft and Coleman, both of whom were surgeons, but the former had, after studying veterinary science in France, practiced in London as a veterinary surgeon, and attained such celebrity as to bring back confidence in the College at once. For a few weeks the business of the institution was conducted to the great satisfaction of the subscribers—"the deserted College became again filled with horses"—when the sudden resignation of Moorcroft gave a shock to the struggling, and so far, unfortunate institution. Coleman was left as sole professor, and he only withdrew his resignation at the earnest request of his friends, amongst whom Sir Astley Cooper was prominent. Coleman had no practical knowledge of horses or their diseases, but he was clever and energetic, a good human anatomist, and an astute business man, with strong friends in the medical world. Writing in 1798 Mr. Bracy Clark says: "The institution now remained solely to be conducted by Mr. Coleman, from whose abilities and ingenuity the science has everything to expect; he has been able during the three years that he has been professor, not only to maintain the institution in prosperity, but has had the address, with the aid of the Committee, to procure the pecuniary assistance of Government, which now affords the institution a handsome annual supply, and places it beyond the probability of ever being destroyed on this account." In these few years, too, Professor Coleman had obtained for himself the appointment of Principal Veterinary Surgeon to the Army, and was entrusted with the selection of veterinary surgeons for the cavalry.

The College during the first ten years of its existence held a very prominent position—it was constantly before the public for some reason or other. The movement which gave it origin had hardly subsided before the death of its first professor again brought it into notice; then Coleman and Moorcroft's joint professorship and its sudden rupture; next the position given to Coleman as Chief of the Veterinary Department of the Cavalry. The books and pamphlets issued by those connected with the College also had an effect. St. Bel, Moorcroft, and Coleman, all wrote on the horse's foot and shoeing. St. Bel, and the practice he introduced at the College, assisted in reducing the weight of shoes then used, and in checking the practice of seating shoes

in the form of a saucer. He also recommended a shoe flat on the foot surface and concave towards the ground. Moorcroft, following an older authority, Osmer, advised a shoe having a good level bearing surface, but not so wide as to press on the sole, to avoid which he had it "seated"—and this form of shoe is the one most commonly used at this day. Moorcroft's essay on shoeing had one good point—he recognised the value of frog-pressure; but to this he sacrificed other necessary principles. He advised parting the soles thin, especially at the angles of the heels, and the use of a thin-heeled shoe. The effect upon the art of horse-shoeing in London, of all the attention given to the subject at the College must have been very great—whether for good or evil is not clear.

From 1791 to 1800 there is evidence of very considerable activity at the College. Students apparently went there with a determination to study, and quite a number of the earlier ones have left some record of work. Blaine, Bracy Clark, White, Percivall, Feron, Laurence, Boardman and all names of men who afterwards contributed to veterinary literature.

Coleman for a time after his appointment was apparently sole professor and teacher. John Percivall was "Assistant Veterinary Surgeon to the Professor" in 1797 and perhaps some years earlier. In 1796 William Sewell, whose father was a farmer in Essex, was apprenticed to Coleman, and in 1799 passed his examination and was appointed Assistant Demonstrator of Anatomy.

The Examining Committee who granted certificates of proficiency to the students consisted entirely of medical men, assisted by Professor Coleman. For the first twenty years of the College, this was perhaps as good an arrangement as could be made. There were few veterinary graduates whose names would have carried much weight on a certificate, but the names of the leading men in medicine and surgery carried great weight, and gave that connection with science which the art then so much needed. Students were taught Anatomy and Scientific principles, which gave them at any rate an immense superiority over the older practitioners with whom they had to compete.

The early teaching at the College, it must be confessed, was very limited. The horse was the only animal referred to, and one professor and an assistant had to do all the practice and teaching. Unless this had been supplemented by the magnanimous permission of leading medical teachers, for veterinary students to attend their lectures gratuitously, our pioneers would have been mere

pretenders to scientific knowledge. Upon the ex-collegiate classes depended all their training in chemistry, materia-medica, and physiology.

St. Bel had started the venture with a much more extensive scheme, and with a much higher standard of the necessities of veterinary students. He was an enthusiast. Coleman was a practical man who "cut his clothes according to his cloth," and permitted no veterinary enthusiasm to outrun his judgment. He obtained financial assistance from Government, an official position for himself, and he accepted the medical assistance so kindly offered without any feeling of compunction that the school did not supply within its own wall all the students' wants.

From 1800 to 1825 very little is known of the proceedings of the Veterinary College. There were no periodicals in those days, and the staff very judiciously committed nothing to paper. We only know that the institution progressed quietly, that students entered and studied, that the practice increased, and that the Professor maintained the dignity of his position in a proper manner. In 1820 the Annual Parliamentary Grant of £1000 ceased, but the College was able to run alone, and took no harm from the withdrawal of Treasury support.

Occasional glimpses of the College are obtained from writings of old students. Thus we learn that Mr. Mayer, of Newcastle, was a student in 1811, and on joining had a ticket of admission to all the lectures at a medical school, presented to him by Professor Coleman. From attending these lectures he joined the Westminster Medical Society, and thus got the idea of starting a veterinary medical society. This he with other students founded in 1812, and their weekly meetings were held in Marchmont Street. In the second year Professor Sewell allowed himself to be nominated as President, but Coleman looked askance at the new society. In the course of another year or two the Society was admitted into the College, and Professor Coleman became patron.

In 1817 William Dick entered as a student, and has left us a glimpse of the College in two letters he wrote whilst a student, to his father. The impression is that a student had to depend greatly upon himself; Sewell was occupied by practice, and Coleman was very often away on consultations, or the business of the Army and Ordnance Department which he supervised. Dick does not seem to estimate the diagnostic powers of the staff very highly, and the treatment of animals described by him shows a practice differing very slightly from the empirical art carried on around.

SOCIETY PROCEEDINGS.

Keystone Veterinary Medical Association.—The regular meeting of the Keystone Veterinary Association, was held at the College of Physicians, Nov., 7, 1891. The President, W. Horace Hoskins, in the chair. Present, Drs. W. B. E. Miller, Chas. T. Goentner, Alex. Glass, W. H. Hoskins, J. B. Rayner, W. S. Kooker, Chas. M. Cullen, R. G. Webster and W. B. Werntz. Minutes of previous meeting were read and approved. The President filled vacancies in Board of Trustees by appointing Drs. Eves, Rayner, Miller and Goentner.

A recess was taken, and the Board, upon reconvening, reported adversely upon the application of Dr. MacFayden, for associate membership, and approved the resignation of Dr. M. W. Drake. On motion the report of the Board of Trustees, was accepted.

Dr. Glass, the essayist of the evening, read a paper on "Bench Show Distemper." Dogs gotten in the very pink of condition are sent from all parts of the country to the show. After or during the latter part of the show, they manifest a disinclination to feed, are drowsy, languid, the coat unthrifty in appearance, eyes watery, nose dry, rapid pulse, high temperature, with in some instances, cough. This constitutes the general symptoms of Bench Show distemper in dogs; which we distinguish from the real or genuine distemper, by the symptoms in the majority of cases, being of a milder form. We have three different conditions resulting from Bench Show Distemper in dogs, which are of a serious nature, first, the Pneumonic, second, the Abdominal, third, the Nervous. In the first, or Pneumonic condition, we have all the symptoms seen in the same disease in other domestic animals. In the second, or Abdominal condition we have enteritic symptoms, with either a diarrhoea or dysentery, or the opposite, excessive constipation. This condition as well as the first condition requires very careful nursing, and rational treatment to bring about a good recovery. The last, or Nervous condition is the one in which the results of treatment are generally very unsatisfactory.

The cause of Bench Show Distemper, in a great measure, is brought about by change in the manner of both feeding and housing. Another source is no doubt, due to the fact, that these dogs are housed in one system of kennel, called the Spratts' Bench System. These wooden benches or cages are moved from one city to another throughout the whole country, and have only a mere superficial cleansing with water.

The percentage of cases of Bench Show Distemper would no doubt be much less if these kennels were thoroughly disinfected and more care given to the cleansing. Dr. R. G. Webster, then reported the following cases :

On the 12th of April, 1891, I was called to attend five cows of a man's herd, which he said were acting very strangely to him. I drove to his place at once, found the five cows in a stable, at first glance they appeared to have nothing the matter with them, as they were eating hay at the time; their coats were glossy, and in fair condition, but on a closer examination, found a very serious trouble. Accidentally touching one upon the back, she almost

fell to the ground, losing all power and control of herself, her legs were almost useless, she then showed a very wild look out of her eyes, as though in great distress; by taking my hand off she soon went to eating again, temperature and respiration were normal, pulse weak but not fast; could handle her anywhere over body, except spine, without her showing any distress. The history the owner gave was that the week before he had one old cow to get down, and could not rise again, he thinking she was paralyzed from old age killed her; thinking nothing more about it until four days later in going into the stable in the morning found the five as before mentioned. I found they were feeding upon malt-dust and clover-hay, and during the winter got it mixed with corn-meal, hut, his corn running out about a month before had been since then feeding the malt alone, was feeding one ton every ten days to twenty-seven head, soaking each feed for twelve hours in three hundred quarts of water. I looked at the hay and malt but could see nothing wrong with either, or anything about the barn or yard as everything was clean. Thinking the trouble might come from feeding malt too heavily I had it discontinued and gave tonics to the cows.

I looked at the rest of the herd in the lot before going away, they appeared to be all right. On the 13th, I did not see them, on the morning of the 14th, the owner was at my office by six o'clock reporting eight more effected in the same manner. I ordered him to send at once for State Veterinarian Dr. Bridge, which he did. I got to his place about ten in the morning, he had turned them out into the lot, I looked them over and found the whole twenty-seven more or less effected, two not being able to get out of the stable, one down not able to get upon her feet but was eating, was very hungry, gave her a bucket of water, drank it down without any trouble in the least, gave another bucket, drank it, wanted more, gave her some dry bran, she licked at it as any healthy cow would. Her temperature and respiration were normal, pulse weak; the other apparently the weaker of the two could get up and down, was hungry and thirsty as the first. If the cows were in the field they would be eating grass, then all at once would stop, stamp their feet, kick at belly and then start to run as if bees were stinging them, would elevate tail over back and run this way a few minutes, then stop and go to eating grass; they did this every five or ten minutes.

Others not so bad, would only stamp their feet. I did nothing for them. Dr. Bridge came on the 16th, examined the cattle and diagnosed the trouble to be in the clover-hay, which was at once stopped. I gave each cow a large dose of Mag. sulph., followed by tonics. On the 17th, I saw for the first time the cows come out of the stable; here was where the trouble showed itself the most, coming from the dark stable to the light, during the first few steps the fetlocks would hardly bear them, they would turn and almost throw them down. As soon as they came to the light they would start back, stare around, blink their eyes and were not able to distinguish objects; one cow especially could hardly get through an opening twelve feet high by fifteen wide, making several attempts before getting out, she would start out then step back, start again, bend down until belly almost touched the ground, after doing this several times she got down upon her knees, rested in that position a few seconds, then got up and passed out without any trouble and went to eating. She did this three mornings in

succession, before improving the whole herd went through these actions more or less in getting out, all were very thirsty and drank a great deal of water.

Of the two which were in the stable the one that was the weakest, but able to stand, got down in the night and died while I was looking at the others; she ate some hay and drank water early in the morning. the other one still down but eating and milking some.

I saw them again in the evening they were apparently much better after standing out all day, the stiffness and trembling was improved. On the second day they came out of the stable much the same as the day before but did not seem so nervous and it soon passed off after being out. The cow that had been down since the 14th, died during the night. I held an autopsy on the two which had just died; the first thing noticed upon opening them was a peculiar smell, different from any I had ever encountered in any other cadaver, as near as I can describe it, it was like rotten eggs.

I found all the internal organs in a normal healthy condition except a very slight inflammation of the brain and lesions of the stomachs; the whole affection seemed localized in the stomachs. The mucous membrane was almost entirely separated from the wall of the rumen and manplies leaving it of a purpleish hue, looking very much as if having lain in water for several days. Both cows were in the same condition.

On the 19th, I saw them come out of the stable, the whole herd came out better than yesterday. Having hay in bunches about the lot, the cows chased and hooked each other around in their eagerness to get at it. An old cattle dealer that was looking at them at the time remarked, "that those cows were not sick, as sick cows would not eat in that way. On the 20th, when the cows were coming out of the stable I detected one that was very stary, I had here at once put back and gave mag. sulp., one lb., the herd generally seemed more stiffened up, not so well as yesterday. Thinking the tonic too strong for the weak condition the stomach was in, I changed it. I put lime in the drinking water as they were drinking an immense quantity of it and then bloating up, they would go to the water-trough looking thin, in a half hour they would be bloated up so as to be hardly able to get around.

Some of the man's neighbors told him if he would only turn his cows out upon good pasture that would be the end of it, he thought he would try one first, this one had been very bad but was improving nicely when he turned her into his lawn for about one hour, where the grass was good, she then went to the water and drank, but did not get ten feet from the trough until she fell; she lived for a week after but did not get upon her feet, at the end of that time seeing no improvement, I had her killed. On the 21st, I did not see them come out of the stable, they bloated some after drinking water; on the 22d, they were all doing better. On the 23d, one old cow which I had advised being kept out of the stable all the time had been getting along nicely, the night being cold the owner put her in, she got down during the night, could not rise in the morning and lived two days when he killed her.

I did not see them again until the 27th, they were then all doing well, picking up in flesh and giving almost as much milk as before. Of the four

cows which died, as they were his best milkers, he was feeding them more than any the rest.

Dr. Hoskins was of the opinion that the trouble was due to some mould fungus or germs which had produced the result, similar, in many instances to the so-called cerebro-spinal meningitis in horses. Dr. Rayner was sure that it was due solely to the feeding of malt-dust, but could not explain what there could be in the food that would produce the results cited. Dr. Kooker gave the composition, and manner of preparation of what is sold as malt-dust. The cases cited were of great interest to the members present, and remarks were made and questions asked by everyone present. The opinions of the majority being that the trouble was the result of mould. The subject of Mycotic Stomatitis was brought up for discussion. There were over 300 cases reported as having been treated by members present. Dr. W. B. E. Miller stated that it was due to a vegetable irritant likely of the ergot groups. All cases were of a mild character which yielded readily to treatment. No fatal cases reported.

The treasurer reported collections for evening \$39.00, against which orders for printing, rent, etc., were drawn to the amount of \$38.25. The President, Dr. Hoskins, announced that a remedy would be discussed at the next meeting. Adjourned.

W. S. KOOKER, *Secretary*.

Massachusetts Veterinary Association.—The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, Oct. 28, 1891, at 7:30 o'clock.

President L. H. Howard in the chair. Members present: Drs. Bryden, Blackwood, Burr, Howard, Hadcock, Marshall, Osgood, Winchester, Winslow and the Secretary. Honorary member: Dr. Stickney. Guest: Dr. E. F. Harrington.

Minutes of last meeting (held in June) read and accepted. Unfinished business. Amending Constitution.

Dr. Osgood thought that the name of anyone proposed for membership should lie over a month before being balloted upon, so as to give ample time for looking up the applicant's record. Dr. Bryden thought that we ought to act in accordance with our State Charter. At the same time if there was any bugaboo it ought to be gotten rid off. The question is upon suspending the clause requiring a thesis as a requirement for admission, for a period of two years from last April. Ballot taken. Resulted in seven votes, all in the affirmative.

The Secretary reported a letter from Dr. Donaldson, of Clark University, acknowledging the receipt of spinal cord of the old pony killed for string-halt, at Ward's Wharf, last summer, and saying that he would report the result of the microscopic examination as soon as it was completed.

The committee consisting of Dr. Winchester and the Secretary, which met a committee from the Board of Control of the State Agricultural Experiment Station, at Amherst, consisting of President Goodell, and Secretary Sessions, of the State Board of Agriculture, Thursday, July 2, at the Commonwealth Building, Boston, to talk over the advisability of appointing a

veterinary pathologist at the State Experiment Station, reported, that the committee that they conferred with were favorably impressed with the idea, and that President Goodell was to formulate a plan of procedure, but that unfortunately he had gone abroad for his health and could do nothing about it at present.

The Secretary reported having seen Mr. Sessions that afternoon, who said that he had not yet given the matter any thought, as he was waiting to see what President Goodell advised doing. Motion made by Dr. Osgood, and seconded by Dr. Winslow, that a vote of thanks be given the committee, and that its report be accepted, and that the committee be continued with full power to act. Carried.

Application for membership received from Dr. E. F. Harrington, and referred to the Executive Committee.

New Business: The Secretary reported the resignation of Dr. A. W. Clement, of Baltimore, who resigned because he had not lived in Massachusetts for three years, and therefore failed to avail himself of the benefits of membership in the Association. Moved by Dr. Winchester, and seconded by Dr. Osgood, that Dr. Clement's resignation be accepted with regrets. Carried.

Dr. Osgood then filed a request in writing, with the Secretary, to still further amend the Constitution by providing that Article III. shall be changed, so that applications for membership in this Association must be made in writing to the Secretary, with the presentation of the applicant's credentials. Said application must be presented to the Association at its next regular meeting, at which time the Secretary is to present the applicant's credentials to the Executive Committee, which after examining the same, shall report to the meeting. If favorably reported on, the name of the applicant shall be laid on the table till the next regular meeting before being voted on. During this time the Secretary shall notify members of the Association in writing of applicant's to be voted upon at each regular meeting. If accepted the Secretary shall notify the applicant of the same.

Reports of cases.

Dr. Stickney reported the case of recovered cœcal fistula in the bay mare killed at Ward's Wharf this afternoon.

A vote of thanks was given Drs. Stickney, Saunders and Peters, for their interest in buying the mare and keeping her until now for post-mortem examination. A number of the members expressed their willingness to contribute their share towards the expense of the same. (A detailed report to be written later, and a copy kept for the Association, and copies given the veterinary journals.)

Dr. Winchester then reported four very interesting cases, as follows :
1. Fistula of Steno's Duct in a horse. 2. Two spleens in a colt, one abnormally large. 3. A case of canine rabies, having a long incubative period. 4. Peritonitis in a horse, following the rupture of the peritoneal coat of the stomach.

Moved by D. Blackwood, seconded by Dr. Marshall, that Dr. Winchester be given a vote of thanks for recording these cases. Carried.

Meeting then adjourned.

AUSTIN PETERS, *Secretary*,

Ontario Veterinary College, Veterinary Medical Society.—The Veterinary Medical Society in connection with the Ontario Veterinary College was organized Oct., 21st, with the following office bearers: President, A. Smith, F. R. C. V. S.; Vice-President, C. H. Sweetapple, V. S.; Secretary, J. S. Grove, of Akion, Ohio; Assistant-Secretary, J. W. Watson, Peru, Indiana; Librarian, F. W. Swearingen, Decatur, Ill.; Treasurer, J. H. Hester, of Nebraska.

This society meets regularly twice a week throughout the session. All the gentlemen of the Senior class being required to read papers before the society, and the discussions on many subjects would do credit to older heads. One of the most interesting meetings thus far was held Wednesday evening, Oct., 28, when the following interesting programme was presented and appropriately discussed:

Essay; S. Somerville, Buffalo, N. Y., "Purpura Hæmorrhagica;" J. J. Elliot, Washington, Ontario, "Enteritis;" Thos. Trinder, Cork, Ireland, "Chorea;" E. L. Button, Durand, Mich., "Alôes."

Communications were made by W. T. Hart, Raveuna, Ohio, "Sitfast;" J. N. Umphery, Udora, Ontario, "Parturient Laminitis;" J. S. Thompson, Galena, Ill., "Nasal Gleet;" D. McCuaig, Bellville, Ontario, "Incised Wound."

J. S. GROVE, *Secretary.*

Western Iowa Veterinary Medical Association.—The third meeting of the Western Iowa Veterinary Medical Association was held October 21st, 1891. The meeting was called to order by President Johnston. Present: S. H. Johnston, President, J. I. Gibson, Vice-President, G. A. Johnson, Secretary-Treasurer, and Prof. W. B. Niles, of the Veterinary Department of the Iowa Agricultural College.

Minutes of previous meeting read and approved. Letters were read from J. J. Miller, V. S., Sioux City, S. Stewart, D. V. M., Council Bluffs, and J. M. Smith, V. S., Cherokee. The President reported that as a committee to procure a list of service fees, of the Ontario Veterinary College, and I. S. M. D. A. he had secured a list from the college but not the other.

Under unfinished business, two articles, one on ethics, and one regulating changes of the by-laws were added and the by laws thus completed were adopted. Under new business, the subject of legislation was discussed and it was the unanimous opinion that it would be impossible to get an iron clad bill through the coming legislature, and that any law that recognizes quacks, who have just been practicing five or ten years is a detriment, and an insult to the profession. But all thought that a law could be framed and passed, that puts no restrictions on quacks practicing, but forbids them the use of the title Veterinarians or analogous titles. If such can be had, it will enlighten the public, so that they will know what kind of a practitioner they are employing. A list of service fees were drafted to be presented to the I. V. M. A. at the meeting to be held at Des Moines, November 12 and 13, 1891.

The Secretary was elected a delegate to the I. S. V. M. A. The application of J. J. Miller, V. S., of Sioux City, was presented and he was elected a member.

The President then called on G. A. Johnson who presented a paper on "The Preparation of Animal Sutures and Pilocarpine as a Purgative for the Horse."

During the discussion that followed Prof. Niles advanced the idea that eserine in large doses caused the discharge of watery fæces.

Prof. Niles then reported a case, from the college hospital record, of pelvic abscess situated between the rectum and the vagina, which was opened per vagina, and readily healed under antiseptic treatment.

The association then adjourned to meet again in January, 1892.

G. A. JOHNSON, *Secretary*.

Western Pennsylvania Veterinary Medical Association.—The regular monthly meeting was held at Dr. J. C. McNeil's office, Saturday Nov. 14, 1891. Drs. H. S. Jackson, of Sewickly; D. Martin, of McKeesport; and R. Recktenwald, of S. Side, were present as visitors. Minutes of last meeting were read and approved. Jas. A. Waugh, V. S., read a paper on "Electrical Accidents to Domestic Animals," which was discussed by all present, and a vote of thanks was extended to the essayist. Dr. J. C. McNeil volunteered to read a paper at the next meeting. The next meeting will be held on the first Saturday in December.

JAMES A. WAUGH, V. S., *Secretary*.

REVIEWS.

HAND BOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS, INCLUDING THE PHYSIOLOGICAL ACTION OF DRUGS, THE SPECIAL THERAPEUTICS OF DISEASE, OFFICIAL AND PRACTICAL PHARMACY AND MINUTE DIRECTIONS FOR PRESCRIPTION WRITING. By Sam'l O. L. Potter, A.M., M.D. (Jeff'n), M.R.C.P. (Lond.), Professor of Theory and Practice of Medicine in the Cooper Medical College of San Francisco. *Third Edition Revised*. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1891.

The modern student of medicine, human or veterinary, cannot complain of lack of facilities for the prosecution of his special work, since every year a new treatise on questions pertaining to the subject matter of his studies is issued from the press, each exhibiting some special feature of recommendation, or some salient point of interest. And this is as it should be, for the ever accumulating mass of materials which modern research has

brought to light needs a constant systematization in order that the student may not be lost in a wilderness of fragmentary facts. Of recent works that have appeared with this important object in view, none will recommend itself to the student or practitioner more strongly than the excellent treatise of Dr. Potter. It is fully up to the most advanced line of current medical thought and bristles with interesting facts and observations. But the chief features of its excellence lies in its faultless arrangement. The initial chapters on the administration and classification of medicines are brief in statement, pithy in matter, and lucid in arrangement. Here the student becomes acquainted, almost at a glance with the methods by which the animal economy falls under the influence of drugs, and the chief agents that produce effects on the various organs of the body. The action of each leading pharmaceutical preparation is briefly stated in larger type and special remarks follow in smaller print, so that the student can readily discriminate between what appeals to his attention with reference to its importance and what he is not so peremptorily obliged to remember. This same convenience of arrangement pervades the whole book and invites the attention of the students by its attractiveness. The latest additions to the armamentarium of the physician are here given and the most interesting details are added. The one page devoted to the consideration of antidotes and antagonists is replete with valuable information and will supply more knowledge to the student than many pages of recognized standard works. Perhaps one of the most difficult points with which the young student of medicine has to struggle is the art of writing prescriptions, of determining the doses, of fixing the proportions and ascertaining the separate and combined effects of various drugs.

Many text-books, with a view to overcoming this difficulty, append to their pages a list of prescriptions made out in full with directions accompanying and a statement of the circumstances under which they may be profitably employed. This proceeding savors of empiricism leads to routinism and is eminently unscientific. Dr. Potter deals with the difficulty in a far more logical and, at the same time, far easier manner.

He begins his chapter on pharmacy and prescription writing with clear and concise definitions of all the terms that constantly confront the student; he then briefly discusses the natural history and chemical constitution of each substance, points out its physiological and pathological properties, assigns the dose and considers its synergic and antagonistic qualities. The author deplors the fact that so many enter upon the study of medicine without a sufficient preparatory knowledge of the humanities, and he wisely recommends those who possess no knowledge or an imperfect knowledge of Latin, to write their prescriptions in English. It is better to avow ignorance than to put on the caps and bells of a Cagliostro. We take great pleasure in cordially recommending Dr. Potter's excellent treatise to the medical profession and above all to students of human and veterinary medicine.

C. M. O'L.

THE JOURNAL OF
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AND Veterinary Archives.

EDITED BY

W. A. CONKLIN, PH.D., D.V.S.,
Director of the Zoological Gardens, New York;

AND

R. S. HUIDEKOPER, M.D., VETERINARIAN,
Professor of Sanitary Medicine and Veterinary Jurisprudence, American Veterinary College,
New York.

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